

Office of the Chief Information Officer Operational Information Technology Plan

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Chapter 1 Infrastructure and Office Automation Initiatives



CHAPTER 1

INFRASTRUCTURE AND OFFICE AUTOMATION INITIATIVES OPERATIONAL INFORMATION TECHNOLOGY PLAN

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1.0 Overview

Agency and business area strategic visions, goals, and objectives indicate the direction necessary to successfully perform the USPTO mission. Using the framework of governing strategies and program objectives as guidance, strategic information technology projects are the high-level operational action plans that provide more specific details about how information technology will be used to implement this direction.

Each business area has ongoing and planned efforts to develop new AISs and enhance existing AISs to improve mission performance. To maximize investments in infrastructure technology, USPTO has established an Enterprise Architecture that provides enterprise-wide services. These services are provided by shared resource organizations in the following areas:

- **Enterprise Architecture**: Provides a “blueprint” to define, develop, implement and maintain the USPTO’s current (baseline) and desired (target) architecture, as well as transformation-sequence plan for the management of the USPTO information technology investments;
- **Enterprise Application Integration Middleware**: Establish, maintain, and support enterprise-wide architecture infrastructure;
- **Network Perimeter and Infrastructure**: Provide an enterprise-wide network and infrastructure that is secure and reliable; and
- **OCIO Program Support Services**: Provide program assistance to maintain the strategic focus on IT management and offer the highest level of IT products and services through quality assurance.

The resulting IT product and service infrastructure supports the entire USPTO. This chapter provides a detailed description of all ongoing and planned information technology infrastructure projects.

1.1 Enterprise Architecture

Enterprise Architecture is a strategic information master plan (or blueprint) that defines the mission, the information necessary to perform the mission, the technologies necessary to perform the mission, and the transitional processes for implementing new technologies in response to the changing mission needs. The Enterprise Architecture includes the baseline architecture, the target architecture, and the transformation-sequencing plan that migrates the current (baseline) architecture to the target enterprise architecture. The USPTO Enterprise Architecture, integrating with USPTO *21st Century Strategic Plan* and OCIO *Strategic Plan*, provides linkages to the USPTO information technology capital



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planning and investment control (CPIC) process, the OMB Exhibit 300 budget justification and reporting requirements for major IT investments, as well as the management of capital assets. The USPTO Enterprise Architecture supports the OCIO information technology strategic goals, ensuring that USPTO's information technology is aligned with the Federal Enterprise Architecture for electronic government (e-Gov) initiatives, components reused and infrastructure interoperability. These areas provide information sharing internally within the USPTO and externally across federal agencies, as well as with the USPTO international business partners.

The USPTO Enterprise Architecture comprises five integral sub-architectures: Business Architecture, Data Architecture, Application Architecture, Technology Architecture, Information Technology Security Architecture. The USPTO has officially established the Enterprise Architecture Program Management Office to manage, monitor, and control the development, use, and maintenance of the USPTO enterprise architecture. Each of the sub-architectures is aligned within the USPTO Enterprise Architecture Program Management Office to assume its specific portions of responsibilities for business, data, application, technology, and information technology security. The Center for Excellence is delineated as a proving ground for Enterprise Architecture compliant solutions and services that support the broad range of information technology disciplines, and concepts that are to be developed within the USPTO.

The Enterprise Information Technology Roadmap (Enterprise IT Roadmap) is also a critical part of managing the IT projects at USPTO. The Enterprise IT Roadmap presents the strategic and operational plans for each of the agency's more than 100 AISs. This document identifies the relationship between the aforementioned plans and the USPTO's business initiatives, technology initiatives, and evolving standards inventory. The Enterprise IT Roadmap consists of five elements: (1) Functional Roadmap (2) Application Roadmap (3) Standards Roadmap (4) Technology Roadmap, and (5) Integrated Roadmap:

- Functional Roadmap – Identifies business strategic initiatives defined by the 21st Century Strategic Plan and further developed by the Action Papers. This roadmap provides planned, strategic business and functional capability enhancements;
- Application Roadmap – Documents an AIS near- and long-term release plans. This roadmap will help OCIO transition toward an improved application architecture, inclusive of the service oriented architecture to support functional development;
- Standards Roadmap – Illustrates the evolution of the standards baseline at the USPTO based on the Technology Reference Model supplemented with information provided by the vendor community regarding their long-term support strategies; and



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- Technology Roadmap – Identified the major strategic IT initiatives set forth by the USPTO Strategic IT Plan and further developed through interviews with key OCIO managers and staff; and
 - Integrated Roadmap – Brings together the four roadmaps that show how the AISs support functional requirements, change as technology and standards evolve, and track the progress of USPTO applications. This roadmap provides a vertical, integrated view of releases for each AIS incorporating functional, Application, Standards, and Technology planning information.

Each of these Roadmap elements highlights the strategic, tactical, and operational planning information for components and initiatives across a multi-year, forward looking, planning horizon that focuses on the business process and the customers' perspective.

1.1.1 Enterprise Architecture Program Management and Solutions Architecture

a. Description

Program management & governance processes are required to drive the USPTO Enterprise Architecture (UEA) progress in alignment with the Federal Enterprise Architecture, which is in support of the President's Management Agenda. The UEA governance processes will be established to address document management/repository concerns, UEA lifecycle progressions, and UEA standards review cycles. To encourage high quality adoption of UEA amongst USPTO AISs, UEA compliance processes will be formulated to ensure UEA alignment over the entire lifecycle of the AISs. In addition, UEA Strategy Formulation activities are required to promoting the leveraging of USPTO shared infrastructure, and enforcing the reuse of the USPTO IT assets in a Solutions Architecture environment.

Solutions architecture will be aligned with the current Technical Reference Model and its associated standards, with the following objectives: (1) reuse architecture through standardization of patterns for business topologies and runtime pattern process;(2) quickly respond to changing business requirements by leveraging a managed IT infrastructure; (3) promote vendor independence through the use of standards-based products and interchangeable components; (4) improve development efficiency across the USPTO business areas through common open systems environment and resource sharing, and (5) improve interoperability across USPTO applications and mission areas through common infrastructure components and services. The standards that are developed from the solutions architecture approach should serve as a guide for (1) acquiring IT products and services; (2) developing and maintaining AISs; and (3) updating the EA infrastructure and its components. System transformation processes will also be more efficient with solutions architecture.



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b. Commitments and Benefits

The UEA Program Management satisfies the commitment to the staff and customers by optimizing this process to continuously develop more robust enterprise architecture. The Program management of UEA will continue to ensure the alignment of USPTO EA with the Federal Enterprise Architecture Framework (FEAF), the Clinger-Cohen Act, and Federal Information Security Management Act, Electronic Records Management, the E-Government Act, and other Federal mandates. Essentially, the long-term strategic planning under this activity enables proactive tactical activities to make improvements to the UEA maturity and address the transition from the “As Is” to the “To Be” architectures. More importantly, active management of UEA will not only lead to compliance and a blueprint for a modernization program, but promote shared assets and infrastructure, ensure security, and increase availability of USPTO systems for the citizens and productivity for the users, whether they are staff or customers.

1.1.2 Enterprise Architecture Repository (EAR)

a. Description

The Enterprise Architecture Repository is a collection of shared information used to understand and implement the USPTO Enterprise Architecture (UEA). The Enterprise Architecture Repository will be an expansive collection of data for gathering, storing, and providing access to information to help enterprise users make better business decisions. It will be the focal point for all corporate knowledge pertaining to Enterprise automated information systems. The strategy behind the Enterprise Architecture Repository is one of enterprise information collection, integration, and distribution. It will be precisely aligned with the Enterprise Architecture to give a view of applications across the fundamental areas of the Enterprise.

The key role of the EAR is to promote Enterprise cooperation by insisting that all areas of the enterprise move away from their isolated pockets of knowledge pertaining to applications and integrate this knowledge with that of all other areas. This cooperation makes the Enterprise Architecture Repository a comprehensive knowledge base for Enterprise applications and ensures that all areas of the Enterprise are on the “same page.” It supports superlative program management in the information technology environment at the USPTO. The Enterprise Architecture Repository can then be used to distribute knowledge through a variety of methods. These include desktop delivery, reporting, and querying. Enterprise knowledge is delivered in much less time and with much less effort because of the cooperative information collection.

The Enterprise Architecture Repository supports the integration of enterprise architecture information and creates a comprehensive knowledge base for all IT users of USPTO. The establishment of EAR will move away from the isolated pockets of knowledge toward a superlative program management in the information technology environment



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that translates to highly satisfied AIS customers. Customers will have improved understanding of the IT environment through tailored reports and other delivery methods, and reduce the resources required to show alignment with the Federal Enterprise Architecture. The EAR will also provide access security and project sensitive data about the USPTO enterprise architecture and application environment.

1.1.2.1 Application Clearinghouse (ACH)

a. Description

The Application Clearinghouse is the cornerstone of the Enterprise Architecture Repository. The Application Clearinghouse captures and maintains the collection of Automated Information System data across all AETS architectures that AETS needs on a regular basis and that enable robust and reliable concurrent technical reviews. The USPTO Application Clearinghouse is designed to be the focal point for all corporate knowledge pertaining to Enterprise automated information systems. The Application Clearinghouse is aligned with the Enterprise Architecture to give a view of applications across the fundamental areas of the Enterprise.

b. Commitments and Benefits

The Application Clearinghouse satisfies the commitments to the customers and staff by enhancing the knowledge base of the USPTO enterprise architecture practice. The benefit of the Application Clearinghouse is the ability to distribute knowledge through a variety of methods. These methods include desktop delivery, reporting, and querying. Enterprise knowledge is delivered in much less time and with much less effort because of the cooperative information collection. Overall, the Application Clearinghouse is an important and valuable USPTO Enterprise asset. The integrated view of applications across all areas of the Enterprise Architecture provides decision makers with knowledge of applications that makes their search for information more efficient.

1.1.2.2 Metis Application (METIS)

a. Description

The Metis application will be a key element of EAR. The Metis is a software application that will be used to build and implement an Enterprise Architecture model at USPTO in support of e-Government mandates such as the Federal Enterprise Architecture and the Clinger-Cohen Act of 1996. The Metis is a tool for agencies to align their strategic IT plans with the agency's IT investments to ensure that the AISs support the business goals of the agency. This software also provides Model IT planning and management processes and IT assets. It also generates a wide range of model views on demand, and dynamically queries the models to gain precise information and new insights for decision-making.



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b. Commitments and Benefits

The Metis application meets the needs of the customer and USPTO staff by providing state-of-the-art modeling technology for the strategic planners and systems integrators charged with implementing e-Government initiatives at USPTO. The use of Metis will help USPTO to improve operations within divisions, expand information sharing and collaboration across agencies, consolidate IT systems that support similar business operations throughout government, and increase accessibility and accountability to the general public. Metis also enables USPTO to quickly implement enterprise architecture models that provide a comprehensive view of the business processes and IT operations. The customers will benefit by having access to USPTO systems that operate more efficiently through a robust IT architecture environment.

1.1.3 Technology Assessment and Insertion Program

a. Description

There are two types of the Technology Assessment and Insertion Programs. First, the Strategic/Tactical Enterprise Architecture Assessments are needed to position USPTO with an enterprise-oriented, integrated, and coordinated approach to implement key critical emerging and enabling technologies. This Program includes coordinating/setting strategic direction through the Technical Working Model vehicle and Technical Working Group structure as necessary to meet IT planning objectives. Second, the support for functional assessments is needed to implement the major enabling technologies as required to meet USPTO business objectives. The functional assessments include such projects and activities as knowledge management/e-learning, intelligent searching, customer self-service/Customer Relationship Management, workflow/document management, and web portal for Electronic Commerce (e-Commerce) and Electronic Government (e-Gov) developments.

b. Commitments and Benefits

The Strategic/Tactical Enterprise Architecture Assessments represents an advance engineering effort and technology forecasting that helps in defining a large-scale, enterprise-level architecture. This level of effort will enable the USPTO to be in the forefront of the technology curve in a cost-effective, integrated fashion as required. The OCIO's primary goal of achieving/maintaining an open systems environment with all of its associated benefits, costs, and reliability will be realized. Neglecting strategic, enterprise-level, architecture engineering will critically impair major functions such as security, Electronic Commerce (E-Commerce), scalability/performance, and industry driven trends such as web services.



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Conducting functional assessments will enable the USPTO to implement the strategies in the form of an “up-to-date” infrastructure. The USPTO will develop the foundation to support specific projects that are requested and required by the business areas. The emerging and enabling technologies are directed toward patent and trademark business applications during this assessment.

The USPTO Architecture Review Board (ARB) reviews and examines the variety of business and technical issues that are required in the future-oriented USPTO Enterprise Architecture. The ARB will form the technical working groups, as needed, to select, evaluate, and recommend, based on business need, or for inserting new or emerging technologies. The ARB is a cross-functional board that provides resources to foster broad involvement in the ongoing development and governance of the USPTO Enterprise Architecture.

1.1.4 High Level Architecture (HLA)

a. Description

High-Level Architecture (HLA) is a key USPTO mechanism for driving the USPTO Enterprise Architecture (UEA) progress in alignment with the Federal Enterprise Architecture, which supports the President’s Management Agenda. The UEA progress is accomplished by: (1) verifying and documenting each current AIS architecture applying the UEA; (2) determining and capturing the appropriate AIS architectural improvements towards the UEA measuring AIS UEA compliance; and (3) tracking AIS UEA migration progress over time. When considering prescribed solution architectures, emphasis is placed on the importance of encapsulation and interoperability of the USPTO automations, leveraging USPTO shared infrastructure and enforcing the reuse of the USPTO IT assets.

To achieve High-Level Architecture, UEA Coordination is a service that sustains operational and support capabilities by resolving issues that impact the viability of production systems at the USPTO. This service monitors the availability of enterprise capabilities that support development, maintenance, and enhancement of AISs throughout the lifecycle. The EA Coordination team initiates change, directs appropriate intervention, and collaborates with other organizations in order to eliminate barriers to successful deployment.

b. Commitments and Benefits

The primary purpose of HLA is to provide architectural guidance and reviews for all USPTO systems in accordance with the Federal Enterprise Architecture, the Clinger-Cohen Act, Federal Information Security Management Act, Electronic Records Management, and the E-government Act. The HLA system ensures that the requirements of the Federal mandates are incorporated in the USPTO systems to promote shared assets



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and infrastructure, ensure security, and increase availability for the citizens and productivity for the users. The system also highlights the opportunities for building higher quality and interoperability into USPTO AISs without increasing cost. The system allows achieving economies of scale by providing communications and mechanisms for sharing services, infrastructures, and/or life cycle cost across the enterprise. The HLA also provides architectural assistance and facilities such as, data quality, USPTO Enterprise Architecture (UEA) compliance guidance, test and production environment readiness, performance, and security, in support of all systems along their development, enhancement, or maintenance life cycle. The use of High Level Architecture seeks improvements or integrations of systems to leverage shared assets, eliminate duplication of effort, and enhance processing or IT capabilities through emerging technologies.

1.1.5 Strategic Application Architecture

a. Description

There are three key foundations to the Strategic Application Architecture. First, the Concept Application Architecture (CAA) provides the architectural foundation on which existing and future applications at the USPTO are to be maintained and developed. The CCA is intended to provide USPTO's application architects and developers with a blueprint for maintaining and developing systems that meet the USPTO's long term computing goals. The CAA ensures system viability is sustained throughout maintenance and development. Second, the Enterprise Application Integration (EAI) Strategy allows architectural guidance on AIS integration within and across the J2EE and .Net component architectures. The EAI Strategy also provides guidance on integration with Legacy AISs and outlines the steps for continued agency to customer, inter-application, and agency-to-agency collaboration required to implement Patent & Trademark e-Government strategic initiatives. Lastly, the Enterprise Information Technology Roadmap (Enterprise IT Roadmap) is a critical part of managing the IT projects at USPTO. As noted above, the Enterprise IT Roadmap presents the strategic and operational plans for each of the agency's more than 100 AISs. This document identifies the relationship between the aforementioned plans and the USPTO's business initiatives, technology initiatives, and evolving standards inventory. The Enterprise IT Roadmap consists of four elements: (1) Functional Roadmap (2) Application Roadmap (3) Standards Roadmap (4) Technology Roadmap and (5) Integrated Roadmap.

This planning methodology helps to facilitate strategic, tactical, and operational IT planning at the USPTO and to benefit IT project management, through strategic and operational plans for each of the AISs and the identification of linkages between those plans and the USPTO's strategic IT initiatives, and evolving standards baseline.

Essentially, the Strategic Application Architecture provides architectural guidance, which reflects industry standards and best practices, offers recommendations for selection of



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technologies based on standard component architectural patterns, identifies specific product and technology mappings for the USPTO applications architecture domains, and specifies technical details regarding the standard USPTO technical architecture scenarios.

b. Commitments and Benefits

The Strategic Application Architecture assists with early identification of project schedule overlap, dependencies, and issues to mitigate potential risks and negative impacts. The Strategic Application Architecture contributes to a broader and more consistent understanding of organizational initiatives and thereby enables managers to make more informed autonomous decisions that are aligned with common objectives. This architecture facilitates knowledge sharing and fosters a greater appreciation for the entirety of IT efforts and its comprehensiveness instills customer confidence that IT concerns are being addressed.

1.1.6 Topic XML

a. Description

Development of XML resources from an enterprise perspective results in systems fully able to comply with the USPTO Enterprise Architecture, which creates a highly adaptable IT environment required by a rapidly evolving business environment. Encoding content and business rules in the AIS-independent syntax of XML and related technologies creates the technical foundation needed to support work-product interoperability. Document type definitions (DTDs) that reflect the internal business logic of the content ensure the future value of data and maximize potential repurposing of content, significantly reducing future development costs. Content modeling (DTDs and XML Schema) derived from the evolving Business Architecture directly supports model-driven development, reduces redundant efforts, and maximizes reusability of XML resources across systems.

The Senior Advisor for XML Technologies leads an XML Resource Team (XML-RT) that supports projects by providing expertise in identifying, using, reusing, and developing XML resources. In addition, the XML Resource Team will be enhanced to provide technical support and expertise to a number of Patent initiatives, including eCommerce, Next Generation Electronic Processing, and Integration and Workflow, which will exploit XML-formatted data and XML-based technologies. Support consists of developing any XML resources required for the project and advising on their use in accord with the XML Technical Standard and Guideline. Support is rendered in full cooperation and coordination with the assigned SDM and project schedule. This project replaces what was formerly called "XML for ePhoenix."

b. Commitments and Benefits



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The Topic XML investment satisfies the commitment and benefits to the USPTO staff and its customers by offering the following capabilities:

- Conformance with industry, national, and international standards leverages the efforts of others, reducing the costs of Patents e-Gov initiatives;
- Consistent implementation of XML throughout the enterprise maximizes opportunities for reuse, eliminates duplication of effort, and maximizes the future value of data; and
- Decouples system migration from business evolution, reducing the impact of one on the other, and thereby reducing the costs of advances on either front.

In addition, the Subject Matter Expertise from the Senior Advisor and the XML Resource Team will guide Patents' implementation of XML in accordance with industry, OMB, WIPO, and Trilateral standards. The XML products will include business rules and data in system-independent industry-standard syntax. The XML-related services and products will fulfill the mandates of the Federal e-Gov initiatives as well.

1.2 Enterprise Application Integration (EAI) Middleware

This portfolio provides the infrastructure and development tools for the Center of Excellence for Technical Services and Solutions. The Center for Excellence provides a testing ground for enterprise architecture compliant solutions and services that support the broad range of information science disciplines (e.g., business, data, application, and technology engineering). The Center manages and leads the USPTO Integrated Development Environment (IDE) and research and development laboratory facilities. The development tools and infrastructure are used in the following purposes:

- Enterprise Architecture Compliance best practices proving ground;
- Enterprise Application Integration (internal) best practices;
- Business-to-Business Integration (external) best practices;
- AIS development best practices;
- Layered reuse best practices (e.g., patterns, integration, objects);
- Applying pattern frameworks to the development lifecycle;
- Information security best practices (e.g., technical vulnerability assessment tools and methods); and
- Research and development clearinghouse.

1.2.1 Emerging Technologies Center (ETC)

a. Description



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The Emerging Technologies Center (ETC) operates the Center of Excellence infrastructure (e.g., IDE) and an advanced presentation center. This Center provides tools, procedures, and engineering support to system developers in support of the evaluation of leading-edge technology, development and test of prototypes, and test and evaluation of pilot systems before introduction into the infrastructure. The ETC supports current and new projects into the future, including IDE, Image File Wrapper (IFW), Trademark Information System/Madrid (TIS/Madrid), and other new development efforts.

b. Commitments and Benefits

The ETC provides a controlled environment to develop and test business critical AISs for functionality, performance, and disaster recovery. All projects that use the development environment benefit from the products and services provided by the ETC to ensure that development infrastructure can be successfully integrated with existing business systems. Specifically, the ETC ensures greatest level of customer satisfaction by identifying problems with AISs prior to deployment that reduces system failure. ETC also ensures accurate testing within a clean environment that leads to reductions in production downtime.

The ETC is also used to train the customers and the users of the AIS from a specific training environment and not a test or development environment. This scenario (1) provides for the design and analysis of the training infrastructure and then continued support of that infrastructure; (2) provides the hardware needed to setup the infrastructure to allow training of business units for AIS customers; and (3) ensures a specific set of hardware without interference from developers or production.

1.2.2 Enterprise Application Integration (EAI) Solution

a. Description

In FY 2002, the USPTO initiated the Enterprise Application Integration (EAI) hub in support of its E-Gov strategy. The EAI provides infrastructure framework for various AISs to share information and services across heterogeneous environments. The EAI entails integrating applications and enterprise data sources so that they can easily share business processes and data with minimum changes to the existing applications. The infrastructure is the underlying hardware and software framework that links systems together via a common, standard hub. In addition, the IDE represents a project from the Executive for Architecture, Engineering, and Technical Services (E-AETS) and Center of Excellence to establish a common environment to support AIS development, leveraging Java 2 Enterprise Edition (J2EE) solutions, and available COTS products. The intent is to provide infrastructure of consolidated servers and development tools that will be highly scalable, readily available, and promotes reuse of an EA environment for all new software development efforts as well as the migration from COOL: Gen to a J2EE



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architecture. Using the IBM WebSphere family of products, the IDE provides an infrastructure to promote integration and testing of platform-independent J2EE solutions, conforming to the USPTO Enterprise Concept Architecture and driving the CIO's vision for an enterprise-wide approach for IT development at USPTO. The IDE includes two environments: the System Integration Testing (SIT) Environment for system integration, and the Functional Qualification Testing (FQT) Environment for FQT that is conducted by Configuration Management (CM).

b. Commitments and Benefits

The EAI lays the groundwork for the OCIO to implement the OMB's business approach to IT development and management by providing a consolidated production environment that conforms to the USPTO Enterprise Concept Architecture, emerging Federal standards, and industry-standard practices. The infrastructure is highly scalable, readily available, and emphasizes the reuse of EA compliant artifacts for all new AISs. As a result, individual AISs do not have to a) purchase the server hardware; (2) purchase software licenses; (3) set up and configure servers; and (4) hire system administrators to manage the middle-tier server. These steps produce considerable savings in money and time. In general, the System Development Managers can concentrate on the business domain logic and application specific issues and focus on the users' requirements and demands. Since the production system is very similar to the FQT environment and the deployment in FQT and production environment is almost identical, deployment becomes an easy task. The EAI has additional benefits as listed:

- Provides a common set of standards that can be used by all stakeholders (including business users, developers, architects, etc) to capture the business or operational process, define the EA and identify the support systems;
- The UML enables system relationships to be more easily represented, communicated, and understood;
- Facilitates communication and uncovers errors more easily than other approaches;
- Introduces a level of predictability to enterprise development with traceability;
- Generates considerable savings on software development and maintenance expenses. Industry statistics suggest that the median relative cost for reuse is 20% of the effort for new development if reuse is applied appropriately;
- Provides faster completion of software development efforts resulting in rapid deployment of new or updated USPTO applications;
- Opens the USPTO's opportunities to reuse the assets from industry and provide the opportunity to share assets among various Federal Government agencies, e.g., OMB;
- Enables the development teams to quick start their application development process through industry standards, proven reusable and extensible templates, and enhanced tool automation; and
- Adopt industry standards as defined by the Reusable Asset Specification (RAS).



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A consolidated environment will also make it possible to provide full-time expert support in the WebSphere family of products, which will increase the quality of production supports for the middleware servers. This capability will enable the OCIO to implement the OMB's FEA framework to support E-Gov projects, and at the same time, comply with its own vision of how the USPTO EA needs to be implemented to support its patent and trademark business process. The IBM WebSphere family of products was selected to support the OCIO's development, execution, and operation of web browser and client based applications, as it provides the most comprehensive set of functions that will allow USPTO to achieve its goals. The WebSphere is composed of several independent components that integrate together to provide an overall net-centric capability. The business value of the WebSphere family of products is necessary for the following reasons:

- Required for supporting various Federal E-Gov initiatives;
- Improves and enhances the current business model with E-Commerce, and adds new capabilities to achieving the future electronic workplace;
- Provides a maintainable, extensible, manageable solution that encourages and facilitates reuse and reduces development time by leveraging the architecture;
- Provides value by adopting existing legacy applications and standardizing the architecture; and
- Allows the OCIO to maintain, operate, and support the USPTO technical environment so that the end-user needs are met in the most cost-effective manner.

1.2.3 Software Developer Infrastructure Desktop Deployment Support and Testing

a. Description

This project provides support for building deployment packages to all user desktops and the process of establishing a set of unified desktop management procedures to ensure that the desktop computers used by USPTO are under tighter configuration control. This activity is intended to provide greater stability of user workstations, and help prevent baseline deviations that impede Help Desk supportability. At the same time, the OCIO will continue to provide its regular desktop support services that include (a) building install packages that get deployed to all user desktops (b) implementation of desktop-based security policies by working with USPTO IT Security Office, (c) coordination among various groups as necessary to ensure that the update efforts will occur smoothly, (d) maintaining baseline images of various business configurations for immediate installation by the Desktop Services Division to new machines, (e) maintenance of positive control and management of software to ensure they remain usable as new hardware (computers and peripherals) are acquired, and (f) evaluation of new software to ensure that they are compatible with existing software at USPTO, (ii) do not install spy ware, (c) do not downgrade system files.



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The deployment packages include installation of executable applications and wrappers in addition to ghost images for use by the Desktop Services Division. The Software Developer Infrastructure (SDI) also includes tests and approval of COTS.

b. Commitments and Benefits

The use of deployment packages has several features that are necessary part of software development as follows:

- Enables the capability for mass release of new software;
- Provides controlled release of limited-license software as requested;
- Enables testing and approval of new COTS software for compatibility with baselines;
- Deploy software changes rapidly to user desktops and avoid individual, manual efforts that are costly and time consuming;
- Fosters less on-site visits, minimal interruption, faster service, and greater user satisfaction with remote installs;
- Allow for faster deployments of new hardware (ghost images easier to install and less prone to error) through automated install procedures;
- Ensure no downtime or lost productivity for users by testing COTS against baseline;
- Produces finished products that are of higher quality, resulting in greater chances of a successful first push;
- Provides a direct line of communications with customers for better support and service;
- Improves overall external coordination of efforts with System Development Managers and customers; and
- Reduces lag time in deployments.

1.2.4 Software Developer Infrastructure

a. Description

The following projects define the SDI project:

- **Application Software Enterprise License Maintenance and Support**: Annual maintenance/subscription fees for infrastructure-wide software used by the various applications are mandatory to ensure that USPTO (1) remains in compliance with legal requirements for continued software use; (2) continues to receive technical support from the vendors; and (3) continues to receive the latest upgrades from the vendors in order to support proper production system operations;



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- **Enterprise Integration Environment Management:** The middleware integration development and production environment including Portal, MQ/MQSI, and collaboration tool was initiated by OCIO to apply an assembly-line concept to software development, where code for different applications will all conform to common standards and service by leveraging Java 2 Enterprise Edition to streamline enterprise architecture. This integration simplifies and unifies USPTO efforts to facilitate AISs as they move from development to production, thus helping to control costs by reducing the time and resources needed for development, testing and maintenance. The Middleware Integration Environment provides an infrastructure of consolidated services, servers, and development tools that will be highly scalable and readily available to support robust end to end processing of Patent and Trademark applications that are preparing to meet Federal electronic government mandates.
- A significant amount of middleware server group services address not only regular operation, deployments, administration, maintenance, and upgrade migration, but it also accommodates two other important mandates: “Best Practice both internal and external consultation” and “Project development level SDM and technical personnel assistance for problem resolution”. For the past six months, the total number of deployment used JUST for on-line administrative DEPLOYMENT in SIT and FQT is over 326 to support TMTT, EXPO, PEAI, PURM, eDAN, and others. This number is reflective of an extremely small portion of IDE efforts. Much more time is spent in infrastructure maintenance, software maintenance, assisting best practice to SDM and project development;
- The middleware group Concept of Operations has committed to providing a 24 by 7 world-class operation that meets or exceeds OCIO’s customer expectations and needs. Continually advance middleware infrastructure excellent to keep up with the rapid evolution of technology will provide USPTO substantial cost benefits to strengthen electronic information dissemination;
- **Microsoft Consulting:** Contractor support services from Microsoft are necessary for on-going efforts to ensure that various applications continue to operate at optimum levels. Software upgrades and patches delivered under Microsoft Developer Network (MSDN) subscription often require on-site Microsoft support to implement and configure. Additional technical support services (for advanced problem resolution) are used and needed;
- **Automated Developer Environment – Development/Acquisition:** This project is required to give the OCIO the capability to investigate and evaluate new IT technologies, technologies and products to determine their feasibility and potential applicability to USPTO’s infrastructure and architecture, to keep up with the increasing demands on its resources. Software development and acquisition



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efforts apply several different approaches that include pilot projects, working demonstrations, competitive process of elimination, and adequacy of vendor support. This project is part of an overall strategy of product evaluations and market assessments that include participation at industry conferences and symposia. The results of these evaluations are provided at the conclusion of each effort, along with recommendations;

- **Automated Developer Environment – Enhancements/Upgrades:** This effort is consistent with the need to ensure that USPTO uses the latest IT techniques, technologies, and trends to keep up with the increasing demands on its resources (faster queries, increased throughput, greater security). Software enhancement and upgrade efforts apply several different approaches, including but not limited to, pilot projects, working demonstrations, competitive process of elimination, and vendor support. In addition, this activity is integral to the overall strategy of product evaluations and market assessments that include participation at industry conferences and symposia and the use of external industry expertise. The results of these evaluations, with alternatives, are provided at the end of each effort, along with the recommended approach. Current applications using COOL: Gen 5.1 can continue using this technology and upgrade to AG version 6.5 if the business case justifies the upgrade, while other applications may migrate to a Java / J2EE architecture. All systems will have to first upgrade to AG version 6.5 in the short-term. Other efforts include a Reusable Assets Strategy and establishing a components library;
- **Automated Developer Environment – Maintenance/Operations:** This project includes maintenance and continued support of OCIO-wide development infrastructure operations, such as the COOL: Gen encyclopedia, and the interfaces between the projects' application code and the environment normally managed by the SDI group. Assistance is also provided in resolving suspected problems with these interfaces. The development environment maintained by SDI consists of the COOL: Gen toolset (client-side as well as server-side utilities) and associated encyclopedia containing modes developed for multiple projects that reside on various development and production servers, and the IBM family of products that include WebSphere, QuickPlace, SameTime, and Rational Studio Enterprise for UML and ClearCase development. Support is provided in maintaining this environment in multiple ways: (1) daily performance tuning; (2) maintenance during core hours; (3) off-hours support as necessary; (4) periodic upgrades; and (5) interfacing with Database Administrators (DBAs), SDMs, and project development staff;
- **Components – Development/Acquisition:** This effort ensures that software reuse practices can be incorporated into as many in-house applications as possible through the use of software components that are either purchased commercially or developed in-house. The purpose is to reduce development time and risk, and



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promote consistency while ensuring that USPTO employs the latest IT techniques, technologies and trends to keep pace with increasing demands on its resources;

- **Enterprise Software Licenses/Maintenance:** This project provides funding for annual maintenance/subscription fees to ensure that USPTO continues to receive technical support and the latest upgrades from the vendors;
- **System Developer Tool Support (Technology Working Groups - TWGs, Tools, Developer Direct Assistance):** The System Developer Tool Support focuses on continuous assessment of industry trends and market direction, participations in technical discussions (internal and external to USPTO), evaluation of products (including Section 508 accessibility), and recommendations on technical issues that SDI believes to be in the best interest of ensuring that USPTO's business needs are met. This effort includes assistance to developers in implementing new software or in adopting new technologies;
- **Software Developer Tools – Acquisition:** This project enables the USPTO to continuously investigate new technologies and techniques for relevance and potential implementation to assist application developers in their development efforts; and
- **Software Infrastructure Operations Support and Maintenance:** Maintenance and continued support of OCIO-wide development infrastructure operations such as the Advantage Gen encyclopedia, the interfaces between the projects' application code (PALM, EXPO, RAM, OEMS, etc.), and the server environment normally managed by the SDI group fall under this project. An increasing area of assistance is to provide resolution in suspected problems with these interfaces and AIS development issues. The development environment maintained by SDI consists of the Advantage Gen toolset and associated encyclopedia containing models developed for these projects that reside on the respective development and production servers. Operational support consists of maintaining this complex, mixed environment in multiple ways: daily performance tuning, maintenance during core hours, off-hours support as necessary, periodic upgrades, interfacing with database administrators, project development staff and SDM, and gathering of metrics data, etc.

Part of the support also involves continued periodic system upgrades and migration to reflect continued vendor updates, as indicated in the AETS Technical Roadmap. This activity will reduce the cost of software development and maintenance by continuing to maintain and update the library of common, reusable software components CBD (purchased commercially or developed in-house) that are used multiple times by different applications such as EXPO, Pre-Exam, RAM, FOS, OEMS, POWER and others. These modular components,



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services, and functions conform to industry standards for managing complex business processes.

At the same time, the OCIO will remain apprised of new IT techniques, technologies, and products to determine their feasibility and potential applicability to USPTO's infrastructure and architecture to meet the goals of the 21st Century Strategic Plan. Industry best practices will be incorporated to assist development teams in their efforts to integrate technology and components into their applications or in publishing new services by leverage existing skills, resources, infrastructure, and development tools.

b. Commitments and Benefits

The services that are provided by the Software Developer Infrastructure enable several capabilities for USPTO as follows:

- Reduced turnaround time in resolving problems;
- Improved response time to customers;
- Impart knowledge directly from Microsoft to USPTO developers;
- Enable continuity of operations during regular and off-hours;
- Enhanced overall support to the development infrastructure and environment;
- Provide general development and maintenance assistance to specific projects as needed;
- Allows USPTO to remain current with technologies of its Federal and Industry counterparts;
- Prevents technology obsolescence;
- Keeps employees interested and involved (higher morale and lower turnover);
- Increased performance and delivery of service;
- Ensures architectures that scale properly with growth;
- Allows for software to be readily replaced, upgrade, or maintained;
- Purchased components can be customized to USPTO's specific needs;
- Reduces overall development and maintenance costs among projects;
- Improved turnaround time in diagnosing problems and implementing software fixes;
- Enables adoption of latest industry standards;
- Provides access to updated device drivers for new hardware, new operating systems, etc.;
- Ensures that balanced, rational, and technically sound decisions are made;
- Allows feasibility and viability assessments of products for potential use at USPTO;
- Increases customer base due to greater accessibility for disabled individuals (American Disabilities Act);



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- Increases pool of potential candidates for employment (American Disabilities Act); and
- Allows USPTO to remain current with technologies used by its Federal and Industry counterparts.

1.3 Network and Infrastructure

USPTO provides enterprise-wide IT services in network and infrastructure. These services are provided by shared resources organizations that: evolve the information technology infrastructure, operate and maintain production systems and networks, manage and support desktop hardware/software and provide customer support, define data access, and archive data. The USPTO has also established a managed, comprehensive enterprise-wide IT security program. Plans, projects, and details associated with this enterprise-wide security initiative will be contained, tracked and maintained in a separate document that will not be released to the general public. The resulting IT product and service network and infrastructure support the entire USPTO.

In addition, the USPTO intends to increase the agility and capability of the organization by servicing the external access requirements of the employees that participate in the TW@H, TTAB Work@Home, and the global intellectual property office partners by merging the best practices from current projects, including TW@H and Secure External Access Solution (SEAS). The Implementation of the best practices will provide a common framework for leveraging the USPTO infrastructure initiatives currently under way such as the Enterprise Directory System (EDS), USPTO Public Key Infrastructure, Firewall Consolidation effort, security policy development, and other related activities.

1.3.1 Network Perimeter

Today, open business environment involves providing easy access to the corporate network for variety of constituents, including contractors, partners, and customers. The Network Perimeter project establishes remote connection for interconnectivity with applications from external environments, and provides means to control traffic through a secure corporate network. The USPTO corporate network supports the necessary business functions by allowing transactions such as payroll processing, Human Resources (HR) data processing, telecommuting, and other activities to occur within a secure environment. There are six systems that support the Network Perimeter activity: (1) Office of Finance Disbursement Network (OFDnet); (2) Office of Human Resources Network (OHRnet); (3) Remote Access Support; (4) Trademark Trial and Appeal Board (TTAB) Work@Home; (5) Trademark Work-At-Home Capability (TW@H); and (6) Trilateral Network (TriNet).

1.3.1.1 Office of Finance Disbursement Network (OFDNet)



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a. Description

The USPTO Office of Finance requires uninterrupted disbursement and payroll processing. To achieve this business function, a secure extranet is being implemented and improved with full redundancy and high availability for direct connection to the National Finance Center (NFC) and the U.S. Treasury. OFDnet provides the connection.

b. Commitments and Benefits

Enabling a secure and reliable payroll file transmission with NFC are fulfilling the commitment to customers and staff. There is also secure and reliable financial file transfers to U.S. Treasury. Both of these connections are performed through the extranet that has secure integration with the Momentum system. As a result, the benefits include an uninterrupted payroll and disbursement processing at USPTO. A direct and secure payroll and financial file transfer between USPTO and NFC/U.S. Treasury is made possible. The data flow ensures the privacy, integrity of payroll, and financial data in transit. This effort makes Time and Attendance data possible and makes payroll operations available.

1.3.1.2 Office of Human Resources Network (OHRnet)

a. Description

The purpose of the Office of Human Resources Network (OHRnet) is to enhance its fail-over features, performance, and security to allow the Office of Human Resources (OHR) personnel to process, transmit, and receive personnel information (i.e., Employee Relations/Labor Relations case tracking, staffing process, Merit Assignment Program) from and to the NFC with minimal loss of time and to support other PTO systems (i.e., Time and Attendance transmission, Online SF50 printing, and Momentum) and networks (OFDnet and PTONet II). The purpose of this system is to offer a continued enhancement approach to ensure that necessary network and security improvements are implemented in a timely fashion and are supported by the OCIO throughout its useful life.

b. Commitments and Benefits

The OHRnet provides a secure and reliable bi-weekly Time and Attendance (T&A) data transmission to NFC through PTO extranet. The online SF-50 printing capability is secure and reliable as well. The communication between OHR systems and the NFC is conducted within a secure platform, just as the interconnection between OF Momentum and NFC. There is secure integration with the OFDnet, Web Time and Attendance System (TAAS), and secure interconnection with PTONet. In addition to meeting these customer commitments, the OHRnet benefits both customers and staff through (1) Direct time and attendance transmission to the NFC; (2) Direct SF-50 printing to the NFC; (3)



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Secure high-speed communication between USPTO OHR systems and the NFC; (4) Privacy and integrity of personnel and financial data in transit; and (5) Support for TAAS.

1.3.1.3 Remote Access Support

a. Description

Currently, the Patent Business Area requires support for contractor staff in three remote sites. The two remote sites in Pennsylvania are to only receive telephone support. The other remote site at Bailey's Crossroads in Virginia is to receive both telephone and full-time, on-site support to meet four-hour Service Level Agreement.

b. Commitments and Benefits

The Remote Access Support project is meeting the commitments to the customers by providing on-site desktop and telephone support to the Patent Business Area contractors to resolve computer issues for 36 workstations in addition to the workstations at the Virginia site in Bailey's Crossroads. In addition, the benefits for both the customers and staff are to ensure that problem resolution and service request is completed in a timely manner within the Service Level Agreement. This effort also meets customers' requirement of on-site desktop support.

1.3.1.4 Trademark Trial and Appeal Board (TTAB) Work@Home

a. Description

The TTAB is an administrative tribunal empowered to determine the right to register, and the subsequent validity of a trademark. The TTAB adjudicates the rights of parties in specific types of proceedings such as oppositions, cancellations, interferences, concurrent use, and appeals from refusals by the Office to register a mark and extensions of time to file a proceeding. In addition, the TTAB receives other related documents and phone inquiries resulting in a high volume of paper and data exchange.

The TTAB Information System (TTABIS) provides the ability to enter data, prepare correspondence, track cases, generate reports for management, and monitor proceedings in an effective, secure, and timely manner. TTAB proceeding information is also available over the Intranet and Internet. Customers can use the Internet to file proceedings via email or via fax and the electronic submissions will be integrated directly into the TTABIS workflow. There are currently 16 TTAB Work@Home users (in FY 2004) accessing TTABIS and PTONet e-mail from home using laptops. The plan is to add 10 more users in FY 2005, four more users in FY 2006, four more users in FY 2007, four additional users in FY 2008, and four more users in FY 2009. Documentation to support the system will also be developed.



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This project provides for converting the current laptops to XP, the development of a Citrix Server Farm, the migration of the current TTAB users to the Citrix Servers, and the expansion of the program to add new users.

b. Commitments and Benefits

The TTABIS supports the Trademark Business Area macro performance goal of enhancing trademark protection. The TTAB Work@Home project provides contractor support to maintain the TTABIS, supplies documentation so that the help desk can support the project, migrate users to the Citrix servers, and add more users. In addition to meeting the commitments to the customers, the benefits to be derived from this system are to (1) provide users with contractor support; (2) provide users with help desk support; (3) promote telecommuting in accordance with Congressional direction; and (4) align operational support with other telecommuting solutions.

1.3.1.5 Trademark Work-At-Home (TW@H) Capability

a. Description

The TW@H program began as a pilot in March of 1997. Each examining attorney in the original program worked at home three days per week and shared an office at the official work site with another work at home attorney. In FY 2004, this project accommodates the Trademark Office adding approximately 60 (40 attorneys and 20 users from the Office of Quality Review). Participants to the TW@H program in FY04, 40 participants in FY05 (administrative staff), 40 participants in FY06, and 20 participants in FY07 to the TW@H project.

In terms of system upgrade, the TW@H is followed by TW@H II, which is an infrastructure enhancement to the TW@H production system. The TW@H II system allows Trademark attorneys to work at home and to remotely connect to PTONet resources. The primary connection method to PTONet is provided through Digital Subscriber Line (DSL) connection, Cable Internet, Integrated Services Digital Network (ISDN) connections, or a secure Virtual Private Network (VPN). The secondary connection method is through a dialup modem to the Mail@Home servers.

The major function of the upgraded TW@H system is to provide secure and reliable access to Trademark applications with an enhancement and update of the Citrix Metaframe server infrastructure. The upgrade is expected to include 20 new production servers and Windows 2K Terminal Server. Other capabilities consist of office applications through Office 2000, FAX capability through RightFax, and e-mail through MS Outlook. The Participants will also have access to other USPTO systems, including X-Search, Trademark Application Management (TRAM), Trademark Image Capture and



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Retrieval System (TICRS), Trademark Tradeups System (TRADEUPS), and TIS/Madrid (in the near future). Telephone service with voicemail should be available as well.

b. Commitments and Benefits

The TW@H program is meeting Congressional mandate by establishing a policy under which eligible employees of the agency may participate in telecommuting to the maximum extent possible without diminished performance. In terms of business results, the Work-At-Home participants have contributed to lower pendency numbers because they are more productive and spend more time examining trademark applications than examining attorney's in the office. The quality of work has been as good if not better than the general work force and their customer service has been excellent. Customer satisfaction has remained high; the Work-At-Home program is generally transparent to the customer.

Employees are satisfied as well. Participants report a better ability to balance work and family issues because of the time saved commuting. They also enjoy personal cost savings for work related commuting expenses. Work-at-Home participants also have a higher retention rate than other employees. For each employee retained, the organization saves the expense of hiring and training a new employee.

In addition to meeting the commitments to the customer and the staff, the benefits of the Work-At-Home program are as follows:

- While the Trademark Work-at-Home program as initially conceived saved some office space by doubling employees, the hoteling program has proven the potential for enormous space savings resulting in large cost reductions related to the rental of office space;
- The TW@H allows for the reduction of leased space required by Trademarks in addition to meeting GSA requirements for telecommuting; and
- TW@H helps to reduce the number of cars on the road, which has a positive impact on the environment, and saves USPTO funding with regard to transportation subsidy.

1.3.1.6 Trilateral Network (TriNet)

a. Description

TriNet is a Global secure network using VPN technology that was initially set up among the Trilateral Offices as directed by the Kyoto Action Plan of November 1997. A VPN is functionally a private network established over public networks by the use of end-to-end encryption technology to protect sensitive information. In the case of TriNet, the public network is currently the Internet. Data sent over TriNet is encrypted/decrypted by encryption hardware devices at the network access points in the Trilateral offices.



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USPTO selected and deployed the encryption and intrusion detection mechanism on TriNet and operates a NMS that monitors and controls the network. Since being established with 3 members, TriNet was extended to include World Property Intellectual Organization (WIPO) as of mid-1999 and at the Spring 2001 Trilateral Meeting; the Trilateral Offices (EPO, Japan Patent Office and USPTO) agreed to expand TriNet to the Canada and Korea IPOs (CIPO and KIPO) on a pilot basis. The Japan Patent Office (JPO) is sponsoring Korea and USPTO sponsors Canada. A combination of adding new offices, upgrading to emerging VPN technology and a life-cycle replacement strategy for the original TriNet equipment led to a decision in May 2001 to begin replacing the current TriNet security devices with new ones that use IPSec technology and the US approved advanced encryption standard (AES).

The present international exchange of national and PCT data between USPTO and other Intellectual Property offices still relies on the physical transfer of documents on optical or magnetic tape media or as paper documents. The EPO, JPO, and WIPO have begun using TriNet for network exchange of sensitive electronic documents. The WIPO, USPTO, EPO, JPO and other major intellectual property offices are in the process of converting their respective workplace environments from paper-based to electronic. At the same time, the WIPO IMPACT and WIPO Network (WIPOnet) projects are underway to automate the Patent Cooperation Treaty (PCT) Receiving Offices at the WIPO International Bureau and other PCT Offices worldwide. The electronic exchange of national patent examination and PCT data, will replace the paper exchange of several tens of thousands of documents with the potential for substantial savings in document shipping, handling, storage, and retrieval. Electronic exchange will also eliminate situations where a recipient has to re-scan documents that have already been scanned by the sender for use in the sender's internal system but were printed out as paper because data file exchange is not implemented. The ability to exchange sensitive patent information via TriNet offers enhanced flexibility in terms of having information available when it is needed and reducing the transfer of unnecessary information.

The Trilateral Offices had been providing each other remote client access to their internal search systems via costly dial-up international ISDN services since 1996. This remote search terminal access is now provided more cost effectively by the TriNet. USPTO has EPO Epoque 2 client workstations, which are connected to the Epoque system at EPO via TriNet. USPTO has deployed Web Electronic Search Tool (WEST) software to the EPO and JPO, which they have installed on normal Windows workstations to access our WEST search server via TriNet. CIPO currently accesses the PTO WEST system with 15 concurrent sessions via the TriNet. JPO updated their F-Term search system to use Internet protocols during 2001. USPTO and EPO are now using TriNet to connect F-Term workstations in their respective offices with the F-Term servers in Japan. TriNet is used for examiner access to foreign search systems because the search patterns/strategies of examiners during the prosecution of cases is considered to be sensitive.



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TriNet, using currently available access control and security technology, will readily support online access and retrieval of USPTO IFW content, Trilateral documents, priority documents, search and examination reports, access to the search databases and exchange of electronic patent application data. Two methods to access sensitive documents are under study: (1) Batch transfer by a Push Mechanism based on a request to a server from an organization in the office of second filing and (2) Controlled access Pull Mechanism for use by examiners in an office of second filing or at an International Search Authority (ISA) to retrieve sensitive documents from an Intellectual Property Digital Library.

The EPO and JPO are currently using a Push Mechanism for priority document exchange between them on a weekly basis. The USPTO has developed PEAI Mechanism for accessing sensitive IFW data such as unpublished application files for submission to the Trilateral Partners and WIPO. The Pull Mechanism proposed by the USPTO makes use of digital certificate based authentication of parties and is connected with work on developing a Public Key Infrastructure among the Trilateral Offices and other organizations such as WIPO.

The Trilateral Offices and WIPO are beginning to use Digital Certificates associated with Public Key Infrastructure (PKI) technology to enable E-Commerce among themselves and with their external customers. USPTO is presently issuing digital certificates for its PKI services that are used by the ePAVE client of the online Electronic Filing System (EFS). In the same time period EPO has begun issuing Digital Certificates and Smart Cards for electronic filing with their online epoline system. The Offices have committed to work for interoperability among their PKI systems as use of this technology expands. In order to achieve interoperability it will be necessary to synchronize the PKI directory and Certificate Authority (CA) servers of the offices to exchange Digital Certificate related information.

TriNet offers a secure channel for support of PKI directory and CA synchronization. TriNet services can be expanded to support key components of the USPTO's 21st Century Strategic Plan in the areas of examiner collaboration and sharing of work products. TriNet service can safeguard the exchange of sensitive information between examiners and provide protection for work processes that are considered sensitive such as a U.S. examiner accessing unpublished case data in the electronic examination process at another office and access to allow sharing of search information before publication. As plans for collaboration and sharing of work products develop, means to ensure strong authentication of identities will be needed. TriNet offers a protected mechanism to interconnect the PKI systems of member offices allowing them to exchange data needed to enable interoperability of the PKI systems as part of a solution for providing strong authentication.

TriNet will be further enhanced to support Patent Enterprise Access Integration (PEAI) project for Trilateral Office access to Image File Wrapper (IFW) content including published and non-published examination files. A new capability will be included for



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Priority Document exchange over TriNet between USPTO and the Trilateral Partner Offices. Other TriNet members such as Mexico (IMPI) and Australia (AIPO) will also be added to the network. In terms of security, a stronger user authentication mechanism will be added for external IPO users that are provided access to USPTO services.

b. Commitments and Benefits

This project supports the USPTO Macro performance goals of: (1) expanding intellectual property rights systems abroad; (2) promoting awareness of, and providing effective access to, patent and trademark information; and (3) advancing the DOC and USPTO critical goal of exercising leadership in the development of a Global Intellectual Property Network. Operating the TriNet provides benefits to the USPTO and other intellectual property offices and their customers by way of:

- **Data Protection**: TriNet protects sensitive data exchange between offices and conceals the nature of sensitive transactions;
- **Efficient Processing**: Electronic transfer of Intellectual Property information will provide for direct online exchange among Trilateral and WIPO PCT office automation systems without having to exchange voluminous paper documents and eliminate the costs of redundant scanning operations. The ability to transfer data when it is ready, such as electronic patent applications, will reduce the time delay inherent in waiting to accumulate sufficient materials to exchange on a batch basis. The on-line exchange via the TriNet also provides up-to-date patent information to each partner office for examining purposes;
- **Improved Database Access**: TriNet has replaced expensive dial-up commercial connections between Offices for access of internal search systems. The security measures that are implemented for external access to databases through TriNet are superior to previous measures from dial-up access and provide improved security and resistance to inappropriate use. Instead of sending priority data where the bulk of it is never referenced, examiners will be able to access the specific documents they need when they need them (Pull Mechanism);
- **Standards for WIPO's WIPOnet project**: TriNet serves as a model vehicle to guide the development of technical standards to govern electronic communications among the International Bureau and WIPO member states;
- **Increase in Intellectual Property Protection**: By providing the Trilateral Offices and WIPO with timely access to the work products of the major offices, the quality of intellectual property protection in those systems will improve;
- **Remote Access**: TriNet supports remote access to internal search systems of partner offices and on-line exchange of electronic priority documents;



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- **Secure Connections**: TriNet provides secure connections that can support sharing of work products by examiners, access to file inspection and dossiers/file wrappers, and interconnection of PKI servers in a cross-certified PKI environment;
- **Prevent Intrusions**: TriNet guards internal office systems from hacking or inappropriate use by external or internal users; and
- **Leadership Role**: TriNet affords USPTO a leadership role in establishing security policies and practices. This system also advances USPTO mission as a world-leader in the IPO community.

1.3.2 Core Network

To maximize its investment in infrastructure technology, USPTO has established the Core Network and Infrastructure System that provides enterprise-wide services. These services are provided by shared resource organizations and components that evolve the IT infrastructure, operate and maintain production systems, provide communication networks, manage and support desktop hardware/software and provide customer support, acquire IT products and services, ensure quality systems are deployed, and define, access, and archive data. The resulting IT product and service infrastructure supports the entire USPTO.

One primary objective of this investment is to operate and maintain the computer facilities, hardware, software, and telecommunications capabilities deployed in support of the USPTO business processes. The in-house staff will be augmented as necessary by contractors to provide the full range of services required across the various hardware and software platforms in use.

Another objective associated with this project is to improve the services provided so that customers have timely, reliable, innovative, and cost-effective access to USPTO IT when and where they need it. An additional objective is to reduce costs so that the increasing number of customer IT requirements may be met. The achievement of these objectives will enable the staff to better meet and exceed customer commitments and established service level agreements.

The Core Network and Infrastructure System also provide IT product assurance automation tools to support performing and managing testing, configuration management, and requirements management. Enterprise data management is also supported by providing components to support USPTO decision making and operations include an enterprise data model, standard data elements, an information repository, a data quality improvement and monitoring function, a data stewardship project, development and implementation of a common data dictionary for international patent



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use, management of Standard Generalized Markup Language (SGML)/eXensible Markup Language (XML) assets through the repository, and support for Unified Modeling Language (UML).

The PTO Network and Infrastructure System provide a broad range of capabilities. The entire suite aims to provide costs efficiencies by providing standard services and tools to the enterprise. One major capability provided is the PTONet, which is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Upgrades to this integrated network enable the USPTO to maintain current business production, improve and enhance current business and IT infrastructure, and migrate systems to operate on an evolving infrastructure. Ongoing investments in the network component of this system are currently yielding the following benefits to the PTONet user:

- **Greater network capacity**: The network was upgraded in 2001 and 2002 to replace discontinued equipment and to provide additional bandwidth. This expanded bandwidth will be in direct support of the business requirements of a fully electronic workplace;
- **Improved accessibility**: The redundant connectivity provided throughout the network by the Alternate Routed Buildings efforts will ensure that the network will continue to provide service despite construction-related traumatic failures;
- **Support enhanced business functionality**: The PTONet client computer connections were upgraded to switched 100 Mbps, which has laid the groundwork for enhanced business functionality; and
- **Industry standard interface**: A Gigabit Ethernet backbone brought PTONet into a leading position with industry-standard networking, making connections easier and more straightforward to engineer. In business terms, this means the USPTO shares a common network topology and technology with industry sectors' networks, making interconnection and access, when necessary, possible. The advantage to the business user is the greater availability of data.

1.3.2.1 Data Load and Maintenance

a. Description

The Data Load and Maintenance staff is responsible for all text and image data load processes and maintenance of both domestic and foreign patent and trademark data. The staff performs the data loading and maintenance of both text and image data for the following databases: Patent Weekly Issue Data Load, Patent Images on the Web (PIW), Pre-Grant Patent Application Weekly Issue Data Load, Application Images on the Web (AIW), Trademark Application Data Load, Trademark Registration Data Load, Global



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Patent First Page Information Data Load, Science Server, Elsevier Data Load, Foreign Image Data Load, Computer Search Support, CD-Rom Reference Library System (CRLS) Update, Pre-Exam “Pre-grant Publication” Support XML Tape Cutting Process, Image File Wrapper “Pre-grant Publication” Tape Cutting Process, Query By Example (QBE) Keyword Database Weekly Update, Digital Linear Tape (DLT) Patent Grant Front-File Tape Creating Process, and DLT Pre-Grant Front-File Tape Creating Process.

The Data Maintenance Staff provides technical support for the loading and maintaining of all text and image data; provides data validation and error corrections to ensure quality and accuracy of all loaded image and other ongoing projects; ensures completeness of text and image data bases by conducting data analysis and creates statistical reports of patent and trademark image data flow. The Data Maintenance staff is also responsible for generating and maintaining all AIS backups to ensure the recovery of data during the time of a disaster. In addition, the data load and maintenance personnel validate loaded (Pre-Grant Publication (PG-Pubs) Data and the scanning and cropping of trademark registrations. Among the activities is weekly loading of data to the US Patent database, the frequent loading of EPO/JPO to the database, the loading of TM applications and registrations, and the loading of non-patent literature and numerous other scheduled ad hoc loads.

A key component of the data load and maintenance is the requirement to automate the numerous loads assigned to the Data Maintenance Branch for processing. This project is to automate loading so that USPTO can successfully secure the new Carlyle site and make use of currently available technology (i.e. File Transfer Protocol – FTP) that will allow loading of the various database updates through automation rather than manual processing of a magnetic tape or CD. This aspect of data loading and maintenance is an integral aspect to the security posture of the new Carlyle Data Center.

b. Commitments and Benefits

Data Load and Maintenance is an IT infrastructure function that supports the Patent and Trademark business areas. Data Load and Maintenance enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure, migrate AISs to operate on an evolving infrastructure, and enhance and improve the tailored lifecycle management process. In addition to meeting these customer commitments, Data Load and Maintenance will provide benefits to customers and staff alike as follows:

- Improving the quality, accuracy, and completeness of both the text and image data bases;
- Extensive validation and error detection/correction of text and image data to ensure and maintain document quality assurance/validation standards, thereby providing the best available document for the users/customers;



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- Create and maintain tape backups for all AIS data projects; and
- Adherence to all product and service conditions contained in pertinent Service Level Agreements (SLA), as coordinated with those offices within the USPTO that subscribe to the SLA program.

1.3.2.2 Data Services – Boyers

a. Description

The staff in the Boyers, Pennsylvania facility provides IT products and services that support all USPTO employees and business areas. This staff provides high volume tape dissemination to private sector customers, scans and prepares trademark registrations, archives all issued patents and trademarks, and maintains microfiche/microfilm files used by the USPTO.

The operation and maintenance of the Boyers data center is critical to providing customers with timely, accurate, and up-to-date business information, including backup support for preparing the congressionally mandated weekly load of issued patents and trademarks. The Boyers facility provides a means for the USPTO businesses to share resources and services, enabling the support of an increasing number of customer requirements. The facility also provides a means for the USPTO to recover critical business information in the event of a disaster.

The Data Services staff is responsible for operating, monitoring, and problem reporting/resolution activities associated with site operations. The staff also is responsible for site system software support and facilities management. System software support includes installing, configuring, managing, and maintaining all system software and database management software. Facilities Management support includes preparing the site for the installation of new equipment, de-installing and accessing equipment that is no longer required, and managing and monitoring the data center environment and facility security.

The USPTO has been implementing a full inventory of document handling equipment for the Boyers facility. This equipment provides environmentally sound storage, in rotating bins, for all of the US Patent “A” set of patents (archived paper copies of all patents issued) and makes them retrievable through the use of a PC-based indexing system that will deliver the desired patent to the operator sitting at the built-in workstation on the device. It is estimated that USPTO will require 60 – 65 of these document-handling systems in order to store the approximately 6.5 million patents now archived. There are currently 59 of these devices resident in the Boyers facility. An additional 8 document handling systems will be acquired in FY 2002. Of these 8 devices, 5 will be used for the storage of archived (backfile) patents and 3 will be used to store newly issued patents. It



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is expected that additional devices be required in the FY 2003 and out-year procurement cycles, not only to service the newly issued patents, but also to complete the storage of archived patents. The number of devices required to fully service the storage of the archived patents has increased due to the increasing number of patents being issued each week.

b. Commitments and Benefits

Data Services is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Data Services enables the USPTO to maintain current business production and improve and enhance current business and IT infrastructure. In addition to meeting these customer commitments, Data Services will provide benefits to customers and staff alike by using the following technologies and management approaches:

- The use of document handling robotics extends the shelf life of the patents significantly by placing these documents in sealed equipment thereby removing the documents from the effects of the outside environment;
- Further use of document handling robotics enables the faster retrieval of patents for copying and rescanning;
- Use of document handling robotics provides a much safer work environment by removing the current shelf storage system whereby an operator must climb a ladder to a height up to 13 feet to retrieve a box of patents and, eliminating the need to return the box to the shelf;
- Adherence to agreed-upon schedules for the preparation of magnetic media for the tape dissemination efforts; and
- Backup capability to prepare the Weekly Issue Patent Image database, and update of magnetic tapes in time for them to be loaded to the database maintained in Arlington, Virginia by the mandated time of 5:30 each Tuesday morning. This backup capability is activated whenever the contractor-provided weekly issue input tapes are either not available in time to complete the loading by Tuesday morning, or the tapes are in error in some way.

1.3.2.3 Data Storage Online Magnetic

a. Description

This project provides prototype, pilot, and deployment of storage technologies for USPTO. The on line data storage includes developing procedures and deploying software for managing storage. EMC Control Center is being deployed in FY 2003, and



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will be operated and maintained thereafter. Technologies include Storage Area Networks (SAN), Network Attached Storage (NAS), Nearline storage, storage consolidation, storage management, and storage on demand.

b. Commitments and Benefits

This effort delivers to the customer and staff high availability storage and consolidated storage. Data stored on line also optimizes storage allocations and utilizations. This process enables effective management of storage through software systems and storage on demand. In addition to the meeting commitments to customers and staff, the benefits include high availability, scalable storage technologies to support the storage of all business critical information at USPTO. The data is also consolidated to optimize storage utilization.

1.3.2.4 EMC Mass Storage

a. Description

The USPTO's E-Gov initiatives require that the USPTO attorneys, examiners, partners, and external clients have timely, responsive access to accurate Patents and Trademark application, pre-grant, pre-registered, granted, and registered Patent and Trademark data. In support of the Patents E-Gov program, Trademarks E-Gov initiative, and all of non-strategic initiatives, which includes but not limited to the IFW/PEAI, TMTT, EDAN, TICRS and E-Postal systems, PALM, TRAM, RAM, PTONET, Momentum, UCCMS, and ECC, the USPTO has implemented Storage Area Network (SAN), Network Attached Storage (NAS), and Near-Line Storage technologies as part of its enterprise storage management strategy. These technologies provide the high availability, performance, redundancy, fault-resilience and data integrity to meet the needs of the USPTO attorneys, examiners, partners and external clients.

b. Commitments and Benefits

The EMC Mass Storage investment satisfies the commitment and benefits to the staff and customers by ensuring high availability of information at optimum performance levels. Other advantages of this activity are as follows:

- Four tiered performance groups each with different performance requirements allow utilization of four types of data storage systems with associated cost factors. Expectations are that the USPTO data storage performance group breakdown will be in the 10/10/20/60 percent range between the highest to the lowest performance levels. With the bulk of the data in the lowest and the most cost effective storage performance tier, the USPTO is exercising fiduciary responsibility;



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- Increased ROI on storage infrastructure by optimizing storage allocations and utilizations achieved through consolidation or reduction of infrastructure overhead/fixed costs;
- With the ability to rapidly respond to storage requests from both the new project initiations and existing project growth, the USPTO is in position to deliver the Agility goal of the 21st Century Strategic Plan;
- The E-Gov framework of enabling electronic processing of Patents and Trademark business operations require that the underlying data be available, accurate and secure otherwise opportunity costs of increased pendency and the risk loss costs of intellectual property rights violations may increase. The high availability and data integrity features of the USPTO enterprise storage infrastructure minimize the loss of productivity and intellectual property loss of patents and Trademark business operations; and
- The Enterprise Storage management solution is designed to provide optimal system operational availability and recoverability. Databases are the main host for mission critical data. With the introduction of new storage strategies and designs, it is now possible to provide higher levels of uptime for customer accessibility. As in the case of IFW, TIS/Madrid, and soon TICRS, it is possible to create full reliable backup copies of the databases without shutting the systems down. This design positions USPTO to provide 24X7X365 availability to our global customers. The design also allows for efficient and reliable recovery of data, if necessary, and the ability to diagnose and resolve data integrity problems with minimal system downtime.

1.3.2.5 E-Postal System

a. Description

E-Postal system provides for electronic transmission of certain USPTO items of U.S. Mail that would otherwise require extensive manual preparation, posting and manual delivery to USPTO customers. For example, E-Postal will be used to deliver notices and correspondence from USPTO representatives to applicants and operate in the USPTO WebSphere environment. All data transferred to the USPS facility is transmitted using secure methods. Once delivered to the USPS facility, the data is handled in accordance with USPS regulations relating to first class mail.

b. Commitments and Benefits

The objective of the activity is to develop a reusable component that can be leveraged across various organizations independent of their line-of-business to send mail to the post office electronically. The commitments to staff and customers are being met and benefits realized by reducing the cost of manual processing of U.S. mail through electronic



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processing and providing a reliable method of sending correspondence or notices to customers. A secure mode of transmission also provides protection of sensitive case information for the customers.

1.3.2.6 Enterprise Server Management

a. Description

As of March 2004, approximately 651 servers exist in the Data Center and over 250 servers operate in the ETC LAB. The 253 servers in the Data Center and the 126 servers in the ETC LAB have already exceeded the maintenance life cycle. In FY 2005, there will be a total of 563 servers beyond the maintenance life cycle. New projects also need server resources for all Business areas. Critical system such as IFW, PEAI, PALM, X-Search, TICRS, FAST/Madrid and all of the underlying support systems require a stable hardware foundation to develop an enterprise architecture infrastructure program and standards based on industry best practices, compliant with the Federal Enterprise Architecture. This new strategy for managing server resources is designed to meet the objectives of enhancing and simplifying the technology infrastructure to support business operations in an electronic government environment (i.e., simplify and unify). In addition to saving money and resources it reduces risk and eases manageability by reducing the number of information technologies and the type of technologies, which need to be managed. Hardware is utilized far more effectively and a number of important efficiencies are realized. System and network management becomes less complex.

b. Commitments and Benefits

This activity meets the commitments and the benefits for the staff and customers by providing users throughout the enterprise superior access to the information, which increases productivity. Server consolidation is a prerequisite for implementing a disaster recovery plan. By reducing the number of sources to be replicated, the manageability of backup operation increases and the fidelity of the data becomes optimal. The potential for system outages and other errors will decrease, thereby minimizing the negative impacts to the business operations. Also, enabling fewer elements to work together will achieve resource consolidation, which is one of the key goals of this project.

1.3.2.7 Enterprise Server and Storage Consolidation

a. Description

This project will optimize the utilization of any new or replacement servers and data storage to consolidate the number of servers & storage by leveraging current technology. This effort will enable USPTO to leverage its resources better as well as prepare USPTO for the move of Data Center to Carlyle & better prepare for Disaster Recovery.



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b. Commitments and Benefits

This project meets commitment to customers and staff by providing Optimal server & storage utilization & scalability, "storage & processing" on demand based on more timely/actual needs, reduction of overall maintenance & support cost, and Facilitation of the setup/engineering of disaster recovery site. In addition, key benefits include (1) optimal use of resources (2) ability to rapidly meet changing business needs (3) reduction of overall costs (4) better preparation for natural and system related disasters.

1.3.2.8 File Transfer Protocol/Virtual Private Network (FTP/VPN)

a. Description

This project is an on-going effort to complete the eGov/ePatent requirements. The goal of this project is to continue the on-going design of the circuit network that can provide and warrant the bandwidth availability to accommodate bulk file transfer of grant and pre-grant products, IFW files and IFW application remote access among USPTO, RTIS Bailey's Crossroads VA, RTIS Horsham PA, USPTO Warehouse at Springfield, VA and the Boyers PA facility. In addition, this project is to fully integrate into the IFW network environment by implementing a secure access network that electronically transfers large size patent application data, IFW data, Pre-Grant Publication products, and Patent Grant Publication products between these locations.

As the Art Units are IFW-enabled, PUBS becomes more reliant on access to IFW. It is critical that the current system access (PALM EXPO, Pre-Exam, EFS, ABSS, PACR, and Intranet) be maintained, but moved to the T3 for additional security and faster access speed, and for real-time access to IFW network. The Horsham, PA T-3 circuit will be used for the export of IFW files to RTIS-Horsham, receive deliverables from RTIS-Horsham, receive updates to PALM on IFW files that have completed initial data capture, final data capture, and pre-grant publication, and obtain real-time access to IFW and PALM EXPO, Pre-Exam, and Intranet files throughout different stages of the grant and pre-grant processes. The real-time access would facilitate the timeliness of the verification of data exports, query resolution, ability to work on PTO actions, and the update of IFW, PALM, and Pre-Exam data as well as provide another backup for the export module. The real-time access to IFW will prevent the PTO from having to implement manual workarounds.

Presently, IFW applications make up only 3.4% of all cases processed. By the end of the 120-day period of Interim Operating Authority, approximately 25% of all applications processed in post-allowance will be IFW applications. This means by the end of that period the PTO will not only have 25% of the issuing patents delayed by over three weeks (2,600 fewer issued patents), but the extra resources utilized in processing those applications will likewise cause the non-IFW applications to be delayed significantly past



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the current time interval of 61 days. The PTO could be looking at the total of non-issued patents being two to three times the estimated 2600 IFW applications.

b. Commitments and Benefits

This activity is meeting commitments to customers and staff alike by providing for the automatic, electronic delivery of IFW data, patent application data to the publication database contractor and receiving IFW data, Pre-Grant products and Patent Grant products. In addition, the benefits of the FTP/VPN are described below:

- USPTO will no longer rely on the aforementioned media and physical file wrappers for file transfers between the USPTO, RTIS Baileys, RTIS Horsham, Springfield warehouse, and Boyers;
- USPTO will be able to transfer the IFW data and patent application data the same day that allows RTIS more days to increase the volume of Pre-Grant Publications and Patent Grants, with minimal manual intervention from staff/contractors supporting IFW, Patent Application Capture and Review (PACR) System, Patent Application Location and Monitoring System (PALM), ABSS, and EFS;
- With the same day validation and feedback of patent application data, Pre-Grant and Patent Products, from RTIS, the USPTO will have the ability to transfer replacement data the same day that it is ready;
- USPTO will be able to validate the products with more lead-time before the publication dates. RTIS will have the ability to transfer replacement products the same day that they are ready;
- Daily use of couriers and vehicles between the USPTO, RTIS, and Boyers for delivery of physical file wrappers and media containing patent application data, Pre-Grant products, and Patent Grant products will be eliminated, improving daily electronic business transactions;
- Boyers will be able create dissemination tape masters and backups from the Pre-Grant and Patent Grant products downloaded from the Bonham server; and
- The increase in lead-time for producing DLTs and CD-ROMs of Pre-Grant products and Patent products will improve delivery time to the product subscribers;
- Verification of Exports - access IFW and PALM EXPO, Pre-Exam and Intranet files to perform a completeness check of the applications and print out/download missing or corrupted images;



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- Print applications and follow-on papers in the event that the export capability is unavailable;
- Resolve Queries - send and receive messages from PUBS (PUBSPrinterRush, PUBSPGPubQD, PUBSIDC, and PUBSFDC), correct data and soft scan printer rush queries/corrections into IFW, download corrections made by the PTO;
- Work on Actions - access IFW mailboxes (PUBSPrinterRush, PUBSPGPubQD, PUBSIDC, and PUBSFDC) to receive and send messages about application files for which PTO has requested actions be taken or request that the PTO takes certain actions on application files in the grant/publication cycle; and
- Update data using PALM EXPO and Pre-Exam on application files in the grant/pre-grant publication cycle.

If data transfer requirements and real-time access to IFW, PALM EXPO, Pre-Exam, and Intranet Systems is not provided/maintained, then PUBS faces significant delays in data transfer, data capture, and data reconciliation. The delays currently experienced have already had a direct impact on the grant issue and pre-grant publication files exported to RTIS. Grant files transferred to RTIS have declined from 3800 files to 3100 files per week. Pre-Grant files transferred to RTIS have declined from 4700 files to 4000 files. Using a conservative estimate, Grant files may decline to 2600 files per week and Pre-Grant files may decline to 3500 files per week.

The consequences of the delays PUBS is now facing with the manual work-around because of the present status of IFW is as follows:

- Average time from issue fee payment to issue for all applications - 61 days
- Average time from issue fee payment to issue for IFW applications - 85 days

1.3.2.9 Voice Network Engineering

a. Description

The OCIO has the responsibility for designing the voice network for the new facilities at Alexandria Headquarters. The operations and maintenance of the network involves routine switch operations, interface and management of 3,500 moves, additions, or changes to the voice network, and management of the Call Accounting System. While the initial costs of the voice network will come out of the Space Consolidation Project, funds need to be identified for AETS/OTAES/NED to maintain, enhance, perform market surveys and plan upgrades.

b. Commitments and Benefits



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The Voice Network Engineering activity meets the commitments and benefits the staff and customers by offering continuous voice system for daily business operations at the Alexandria Headquarters. Included in this service will be capacity and load analysis of voice switching equipment, software updates and upgrades, and market surveys to ensure that USPTO is optimizing its telecommunications services to staff and the customers.

1.3.2.10 Facilities Management (Arlington, Va)

a. Description

The Facilities Management staff maintains the Arlington, Virginia data center, which provides IT products and services to all USPTO employees and business areas. The USPTO's application and database servers, data storage systems, and other IT infrastructure components housed in the data center require facilities with the appropriate structural, environmental, and security conditions.

Customers desire and require timely access to information and tools when these resources are needed. The specialized facilities management expertise required to ensure the secure, continuous operation of the infrastructure is critical to providing the required access as well as performing the USPTO business processes.

The Facilities Management staff prepares the data center for the installation of new equipment, which can include activities such as enhancing the structural foundation, and providing increased power, cooling, or other environmental conditions necessary to keep the equipment consistently in operation. The staff de-installs and surpluses equipment that is no longer required, and provides technical expertise in the design and installation of new equipment and systems. The staff also manages and monitors the data center environment, which includes specialized facility security.

Recent enhancements include the installation of new data storage equipment, automated tape libraries, numerous application development servers, and a secure power feed to the center itself. The most significant enhancement to the facility has been the installation of a second, redundant electrical power support feed that will ensure uninterrupted electrical support in the event of power outages. The Facilities Management staff is involved in the maintenance of the data center facilities, ranging from security equipment maintenance to off-site storage for backup tapes.

b. Commitments and Benefits

Facilities Management is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Facilities Management enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure, and migrate AISs to operate on an evolving infrastructure. In addition to meeting these



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customer commitments, Facilities Management will provide benefits to customers and staff alike as described below:

- Employing the in-house facilities staff to install electrical support for all new equipment, thereby enabling the installation of equipment in the shortest time possible;
- Maintaining the appropriate environmental controls such that the installed equipment is subject to only heat and humidity as specified in the manufacturer's documentation as well as maintaining pertinent heat and humidity levels for human occupancy; and
- Maintaining air quality through the use of air quality studies, thereby providing the best possible environment for the operations and networking staff.

1.3.2.11 IT Facilities Relocation Engineering and Planning

a. Description

The USPTO's relocation to the Alexandria Headquarters requires extensive pre-relocation engineering and planning with equally intensive post-relocation testing and validation efforts. Relocation of the Data Center and ETC Lab should not be considered as a typical office move scenario. Over 650 relatively sensitive/fragile computers and dozens of similarly sensitive/fragile data storage devices are subjected to the jolts and bumps of being carted via freight trucks from Crystal Park to facilities at Alexandria Headquarters. Past experience indicates some portions of the computers/data storage devices will not function properly after the move. In addition, the relocation effort impacts the various contract personnel whose current connectivity mechanisms into the Crystal Park facilities will need to be revised.

Pre-relocation and post-relocation processes need to be planned and executed to minimize potential glitches in servers, storage devices, and network topology relocation. Vendor certified engineers' participation is crucial to the post-relocation process in order to retain/maintain system warranties.

b. Commitments and Benefits

These activities support the USPTO community and its customers by providing a secure means of relocating the Data Center and the ETC Lab to the Alexandria Headquarters.

The Patent and Trademark business operations depend on the operational readiness of the servers, storage, and network components of the Data Center and the ETC Lab. With the increasing interdependency of the AIS/systems, one glitch by one system after the move could potentially result in significant loss of productivity & revenue to the USPTO. This



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investment will minimize the risks associated with moving computer equipment by having the move supported by vendor certified engineers involved in the post-relocation process.

1.3.2.12 USPTO PC Client Standardization and Management

a. Description

This task is to evaluate, engineer, and maintain the operating system and all COTS applications within the USPTO Enterprise Baseline (XP, MS Office, Adobe Acrobat, Rightfax, etc.), which is the base image upon which Patents Baseline & Trademarks baselines are also based upon. The scope and level of effort of this project should be expended to officially include a comprehensive enterprise workstation management strategy (including all software and patch deployment and update capabilities) given the industry trend of increased number of software vulnerabilities and patches requiring additional resources current infrastructure and its tools (i.e., SMS 2000 and Asset Insight) has been found to be unreliable and inefficient.

Re-engineering and consolidating the tools and processes will reduce overall costs while enhancing functionality and reliability. In addition, AISD is required to engineer and maintain Group Policies, which is essential for security and application functionality in Windows XP. In FY 2005, USPTO may need to implement XP service pack 2, which will require much effort due to its inclusion of Security mechanisms to be found in Longhorn, as well as upgrade to Office XP and newer versions of COTS application updates. The upgrades will enhance application compatibility, user functionality and productivity. This task will also ensure security and compatibility with other AISs and USPTO infrastructure.

b. Commitments and Benefits

USPTO PC Client Standardization and Management will allow increased security and reliability of all USPTO desktop workstations benefiting all OCIO customers and staff. This project will also provide faster and more reliable software and patch deployment to reduce "configuration drift" and lower overall cost while optimizing the use of resources to reduce overall cost to USPTO. The project will also offer new features in Office XP to provide simpler and more efficient methods of performing a variety of functions to the end user, including enhanced collaboration capabilities. Cost savings will be realized based on reductions in maintenance cost and increased individual productivity.

1.3.2.13 Network Management Systems

a. Description



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The USPTO requires a high performance, flexible, reliable network infrastructure to support a large number of mission-critical business and office automation applications. Network Management Systems (NMS) performs day-to-day operational management of the USPTO network (PTONet) infrastructure, which extends to more than 10,000 PTONet users and more than 9700 network devices located throughout 18 buildings. In addition, Network Management manages and monitors connectivity to remote sites, including Trademark Work at Home systems, Public Search Room/Universal Workstation (UPWS), Automated Biotech Sequence Search System (ABSS), Mail@Home, FAX, and Patent Work@Home projects.

The NMS ensures that PTONet infrastructure is operating at optimum levels and restores PTONet to acceptable services when an outage occurs or when degraded performance levels are detected. This includes operation of the ATM core backbone, building infrastructure and closet devices. Network Management provides network and automated information server connectivity and operates wide area network (WAN) external connections to remote sites. Network Management operates and maintains the network to ensure that all desktop workstations, servers, and other computer devices communicate with each other in proper fashion.

Network Management Systems performs centralized monitoring of PTONet infrastructure and file servers using the Enterprise Management System. The Network Operations Center (NOC) provides 24 hour a day, 7 day a week monitoring of PTONet. Such monitoring allows network personnel to quickly trouble shoot problems and restore service. In many cases outages are prevented before they occur.

NMS performs preventative maintenance on all network infrastructures devices. PM ensures all configurations are correct and baselined, all hardware is operational, and that "hot-spare" hardware is ready to assume operations should the primary hardware fail. Preventive Maintenance activities have significantly increased the reliability of the network infrastructure.

NMS works with users, network engineers, and system developers to maintain an accurate picture of the network. Network Management coordinates the infusion of new technology into the PTONet operating environment. Network Management maintains accurate configuration records of all facets of PTONet. This increases up time dramatically. Keeping the system uniform throughout allows for easier troubleshooting. Examples of configuration management include maintaining network diagrams and ensuring all components are configured identically (baselined), and ensuring they are registered in the USPTO's inventory system

Network Management performs performance management of PTONet. This task allows network personnel to tell how well the network is operating. The network tracking is accomplished through the generation of activity reports on all system outages, real time performance analysis (current network performance), and trend analysis (network



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performance over longer periods of time). Network Management also performs capacity management of PTONet. As network connectivity requirements are introduced, Network Management ensures the additional network interfaces are available to connect both new users and new servers to PTONet.

In addition, Network Management performs many enhancements to PTONet. This includes support during the infusion of new technology into the PTONet operating environment, assessing new operational requirements, architecting the best solution for integration into the existing environment, and providing operational technical support to various USPTO business area, corporate, and infrastructure projects. Network Management also performs upgrades and enhancements to PTONet infrastructure. Coordination with Office of Systems Architecture and Engineering (OSAE) is performed when this occurs.

b. Commitments and Benefits

Network Management Systems is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Network Management enables the USPTO to maintain current business production and enhance current business and IT infrastructure and migrate AISs to operate on an evolving infrastructure.

Network Management Systems will provide benefits to customers and staff alike as follows:

- Adherence to all product and service conditions contained in pertinent Service Level Agreements, as coordinated with those offices within the USPTO that subscribe to the program;
- Extensive monitoring and error detection/correction of failed or failing components that might jeopardize system stability during production hours; and
- Performance of Detailed Standard Operating Procedures (SOPs) to optimize operational capability and system performance, and to maximize system availability.

1.3.2.14 Operating System Support

a. Description

The USPTO's use of mainframe computers, servers, data storage systems, workstations, and other IT requires specialized technical expertise to install, configure, manage, and maintain all operating system software on a 24 hour, 7 day basis to ensure the availability of needed applications to customers. Expertise is also required to install, configure, manage, and maintain all related system software required to operate the infrastructure



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components, as well as software development tools installed on the various computers. Software and hardware license maintenance is also part of this activity to ensure that USPTO receives patches and release upgrades as necessary.

The Operating System Support staff is responsible for providing technical expertise to system developers, troubleshooting and resolving operating system and related software problems, engineering and integrating operational procedures, establishing policies for all types of systems, writing complex system software utilities and operating system patches to enhance vendor-provided features, and evaluating the feasibility of new/upgraded operating systems. These services encompass the newer generations of infrastructure as well as the current legacy systems. The staff is also responsible to work with the System Performance Measurement Division in reviewing the performance data collected by that group to determine improvements to system quality, availability, and performance so that customers have consistent, timely access to the necessary business tools and information.

b. Commitments and Benefits

Operating System Support is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Operating System Support enables the USPTO to maintain current business production, enhance current business and IT infrastructure, and migrate AISs to operate on an evolving infrastructure, and enhance and improve the tailored LCM process. In addition to meeting these customer commitments, Operating System Support will provide benefits to customers and staff alike by performing the following responsibilities:

- Supporting business customer requirements for high availability of servers running business applications;
- Ensuring that operating systems and servers that host business applications run at maximum efficiency;
- Ensuring availability of system administrator(s) to restore application servers to operational readiness after software and/or hardware failures;
- Complying to all product and service conditions contained in pertinent Service Level Agreements, as coordinated with those offices within the USPTO that subscribe to the program;
- Monitoring, detecting, and correcting error of failed or failing components that might jeopardize system stability during production hours; and
- Support of all infrastructure upgrades, hardware and software, and execution of the integration of these efforts into production.



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1.3.2.15 Operational Support – Supplies

a. Description

As more and more internal and external transactions are performed electronically, the operational support of the IT infrastructure becomes critically important to performing the mission.

The Operational Support staff is responsible for the daily inspection and maintenance of all critical production systems and equipment, ensuring adequate supply of printer toners, bar code labels, bar code printer ribbons, and other assorted materials required to meet the production demands of customers.

b. Commitments and Benefits

Operational Support is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Operational support enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure and migrate AISs to operate on an evolving infrastructure. In addition to meeting these customer commitments, Operational Support will provide benefits to customers and staff alike as described below:

- Adherence to all product and service conditions contained in pertinent SLA, as coordinated with those offices within the USPTO that subscribe to the SLA program and
- Extensive monitoring and error detection/correction of failed or failing components that might jeopardize system stability during production hours.

1.3.2.16 Other Peripheral Devices/Upgrades

a. Description

Currently, this project supports deployment, testing, and maintenance of Radios used throughout the USPTO campus.

b. Commitments and Benefits

The commitment to the customer and staff is being met by offering alternate communication means that is reliable, and this activity will enable more responsiveness in maintaining and troubleshooting the radios.



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1.3.2.17 PTONet

a. Description

The general term for the entire collective USPTO network is PTONet. The implementation of applications or systems such as the Trademark Electronic Application Submission, First Action System for Trademarks (FAST), Image File Wrapper, Mail@Home and Global Patents requires continuous enhancements to PTONet to ensure customer satisfaction in an IT environment in which most internal and external transactions are performed electronically. Implementing electronic commerce to improve USPTO business operations requires continual enhancement to PTONet. The enhancements are needed to address increasing transactions and growing databases as well as continued reliance on the Internet to conduct business with customers and partners.

Activities include planned technology reviews, with associated upgrade and replacement of IT infrastructure components. PTONet follow-on projects will coordinate required infrastructure component changes with the Space Consolidation Project to provide a cost efficient and effective means of upgrading and replacing components. As the move is being accomplished and personnel are relocated, the existing PTONet will be deactivated after the last user has relocated.

The original switches that comprised PTONet were integrated in 1997. They had an expected five-year lifecycle and they were replaced in FY 2002. The next scheduled timeframe for replacement is beginning of FY 2006 as the PTONet III project. The activities that comprised the network replacement effort included a market survey of technology and available equipment, determination of what services and components will be needed, procurement of hardware and software, systems engineering and integration, building upgrades and deployment of new equipment, and testing.

b. Commitments and Benefits

The current PTONet enables the USPTO to maintain current business production, improve current business and IT infrastructure, and provides a means to migrate AISs to operate on an evolving infrastructure.

In addition to meeting key customer commitments, the continued enhancement of PTONet will provide benefits to customers and staff alike through following capabilities:

- **Greater Bandwidth**: PTONet's GE backbone allows the adoption of new subsystems without the concern of having to provide the necessary bandwidth on a network segment basis. The increase in available user bandwidth results in faster network response times for image search and retrieval and other network uses, which translates to greater productivity and effectiveness;



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- **Adoption of an Industry Standard Network Topology**: The GE backbone and GE-compliant layer 3 riser switch topology that comprises PTONet allows the USPTO to readily upgrade the network to accommodate workload growth and improve customer service. Future PTONet upgrades may include other industry standard network topologies. The layer 2 closet switch topology may be changed to layer 3 closet switches to provide more granular Quality of Service;
- **Faster Access to Data**: New technology will continue to evolve and enable users to have faster access to more timely data, which will trigger demands to increase the use of IT to help manage programs and provide new services. One trend is USPTO's greater reliance upon network communications to access both internal and external databases through PTONet; and
- **Greater Reliability**: It is essential that continuing enhancement activities are accomplished to support customer requirements, improve the reliability, maintainability, and availability of network resources and to achieve the level of operational integrity required to support the needs and expectations of the USPTO user community. Also important is the ability to provide the necessary level of security and enable the rapid infusion of new technology to meet the constantly growing demands of the USPTO workforce. With the rapid change in IT expected in the future, planned reviews and upgrade/replacement of infrastructure components enable continuous business operations, business benefits through the incorporation of newer technologies, and cost effective component maintenance and operations.

One other benefit of the current network is flexibility: it is now possible to make the network accommodate the transfer of legacy equipment during examiner personnel moves such as creation of industry sectors and consolidation of offices. The network can provide the same addressing in separate parts of the USPTO campus while the phased move of legacy equipment takes place during production hours, resulting in savings of time and effort in move-related activities.

1.3.2.18 Performance Monitoring and Capacity Planning

a. Description

This effort will help to measure, analyze, and make recommendations on current performance issues in current and future applications servicing the USPTO Business Areas. The goal is to bridge the gap between business metrics and system performance metrics in solving real business performance problems. Services include Monthly AIS Executive report, SPMD web page containing application, operating system metrics, system problem determination, AIS performance problem determination, availability metrics, Application Disk space usage and growth, Work at Home VPN problem



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determination, usage and growth, and Network usage and growth. Other activities include real-time availability and performance monitoring for critical applications, performance analysis of application, hardware, OS software, J2EE environments, and network, analytic modeling of What-If scenarios on AIS systems, and the monthly AIS Executive Report.

b. Commitments and Benefits

This activity will provide improved performance of AIS systems System Performance Management Division (SPMD's) expertise in correlating causality with performance problems to recommend corrective action while minimizing investment in capital. Critical performance metrics used by SIRA are collected and tracked. Also, there will be improved response time to outages of AIS systems with the development of SiteScope monitors for critical AIS systems. Networking infrastructure will be provided with resource requirements for new facility, network growth rates for Internet usage from customers as well as internal PTO users. System modeling of existing AIS systems will be incorporated to design and purchase correct equipment to solve future growth needs and meet response time goals of the application. Additional capabilities that will meet commitments to customers and staff are as follows:

- Provides AIS availability monitoring and performance measurement;
- Offers Network statistics to forecast needs for current AIS needs;
- Provides DSL/VPN usage and problem determination statistics;
- Provide modeling services to model AIS systems and perform what if analysis on new application demands;
- Provides AETS with current growth rates of disk capacity with relationship AIS systems. Integration to EMC Control center for physical assignment to systems will be added in 03 – 04; and
- Offers expertise in I/O performance tuning.

The benefits of the Performance Monitoring and Capacity Planning are described below:

- Improvements to Patent Examiner Computer Search Support (CSS) system to meet response time metrics for workload examiners will be employed. Search and Information Resources Administration (SIRA) depends on performance metrics to ensure that the service goals to the examiners are being met;



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- Institution of SiteScope monitoring for critical AIS systems have resulted in improved availability and improved reaction to outages by providing a real time interface, for helpdesk and all SDM's; and
- Growth rates of network are important for any new facility planning. The phenomenal growth rate of our network link to USPTO Internet Service Provider (ISP) has been upgraded in a timely fashion to anticipate user workload while not expending funds prior to their need.

Analytic modeling will be conducted for systems due for replacement or growth rates that dictate an engineering change. These models enable growth through existing workload of systems like TESS to determine what hardware is required to meet service goals of the customer:

- Synthetic monitors will be available for AIS systems for end-to-end user experiences. This includes providing availability and performance metrics based on these key business transactions. Reporting is currently distributed by the AIS Executive report published monthly;
- Current workload growth on Internet and Work-At-Home projects have increased our need to be vigilant on monitoring PTO's access to the Internet as well as the access to USPTO worldwide. Network engineering has been provided with historical and trend information to plan physical network upgrades with our ISP and our SETA contractors;
- Currently SPMD provides services to the NOC and the helpdesk to perform performance problem decomposition. SPMD has the tools to determine if a problem exists on an individual DSL line, the ISP provider or performance problems exist on the whole VPN;
- SPMD provides what if analysis on existing AIS based on new system load requirements. USPTO can determine if a AIS will need one or more components upgraded to meet new service boundaries;
- SPMD provides logical volume growth rates of UNIX servers which house a majority of the EMC storage. Growth rates are monitored on individual logical volumes, which can help AETS in determining future disk space capacity requirements for the future; and
- SPMD has experience tuning I/O subsystems to optimally perform for the individual AIS system. The I/O tuning introduced to support existing AISs has made the difference between a successful implementation of an AIS and a failure.



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1.3.2.19 Printers – Engineering, Acquisition, Deployment, and Maintenance

a. Description

This project includes the following activities:

- Maintain paper and toner levels, clear jams, and escalate other group printer problems to group printer hardware technicians or group printer Admin/Walk-Up analysts;
- Maintain, troubleshoot, and track changes on the Group Printer Servers and the Walk-up Workstations to include the NT Operating System;
- Configure new and relocated machines for use on the PTONet with access to the HPS servers;
- Add or upgrade software and hardware as necessary;
- Produce baseline hard drives for use in the printers and workstations, and provide periodic preventative checks;
- Respond to trouble tickets within a two hour timeframe, and follow up with other departments to assure the system is functioning properly;
- Assist USPTO in changing standard system configuration as necessary;
- Update all documentation regarding the location, IP address and configuration, software version, asset tracking, and any other information as required; and
- Provide preventative and remedial repair and maintenance, including relocation to Promark hardware and software for the Promark group printers.

b. Commitments and Benefits

Ensuring that the printers are working properly meets the commitment to the staff. Patent examiner printing needs are met by providing regular checks and minor remedial maintenance to ensure availability and quality printing and by keeping the health and availability of the GP servers and Walk Up Workstations optimal. Preventative maintenance, relocation, and two-hour problem resolution of Promark hardware and software related problems ensure an immediate response. The timeframe for staff coverage includes weekends and holidays, ensuring availability of the printers.

1.3.2.20 Topic E-Gov

a. Description

In support of the President's e-Gov agenda, the USPTO initiated the Enterprise Application Integration (EAI) hub project in FY 2003 to enable the integration of systems that need to share data and services across heterogeneous environment. This effort will maintain the EAI Hub system.



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b. Commitments and Benefits

The commitments to the staff and customers are being met by enabling a fully integrated process for electronic filing and processing of patent applications. This integration will continue to provide uninterrupted services to the USPTO customers that are using electronic filing of patent applications.

1.3.2.21 USPTO Enterprise Architecture Directory Services

a. Description

The purpose for implementing the PTO Enterprise Directory Services (EDS) is to assist the USPTO with achieving IT strategic objectives. The IT strategic objectives include single structured location to provide multiple data sources such as reduced “sign-on”, PKI, and an integrated network operating system (NOS) infrastructure. The EDS provides the logical data infrastructure critical to achieving the objectives. PKI implementation commonly focuses on the certificate authority and treats the PKI certificates as being useless without the ability to distribute and integrate the certificates into system access controls. The EDS enables PKI to meet its business objective by distributing PKI credentials to applications and systems. The initial implementation objectives, development of requirements, and creation of an active directory concept of operations, engineering integration with other PTO directories, and integration with PKI, are achieved through development of an extensible AD directory information tree (DIT), creation of a structured AD namespace, and implementation of a demonstrable capability. Key features that are needed for the future include (1) Centralized Access Control & Management which provides identity management with role-based Single Sign-On capability across all applications; (2) interoperability to provide a standards-based access control infrastructure and methodology in support of the Alexandria Campus Smart Cards, TriNet/Trilateral, PKI, and Federal Bridge initiatives; and (3) structured data and data provisioning which standardizes the data synchronization methods and provide a central data repository while reducing the overlapping data among applications and access control systems.

b. Commitments and Benefits

The commitments to staff and customers are being met by the development of Directory Information Tree with Schema. The capabilities of the UEA Directory Services includes Pilot Implementation, Role Based Access Control Structure, Integration with SSO, Deployment into Production environment, Guidebooks for Utilizing Enterprise Directory Services, and Full Implementation. The benefits of the Directory Services are as follows:

- Essential services are provided for the IFW Project (Gaining access controls, credential management, interface management, enterprise consistency);



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- Compatibility is established with other directory services and meta directories with recognized standard methods to Gain Access to Organizational Data;
- Cost savings in hardware support (installation time and helpdesk), reduction in administrative costs, and effective management of user accounts are being achieved;
- Interoperability, higher availability, and scalability reduces down time and associated costs for application migrations;
- Security of data and access controls are enhanced, and user access to resources across operating systems with Single Sign-On offers rapid retrieval of information;
- Meta Directory, a single interface method, reduces the cost to develop and implement systems;
- Greater flexibility is achieved in security with Smart Card and PKI; and
- This project is consistent with Portal implementation and Federal Bridge PKI project.

1.3.2.22 Business Continuity

a. Description

The Office of the Chief Information Officer (OCIO) System Business Continuity Plan will decrease risk by spreading USPTO information assets across multiple, load-balanced physical locations. The OCIO will focus on the reduction and eventual elimination of all single points of failure in production systems and IT infrastructure to decrease the potential for system outages. The objective of this initiative is to guarantee the availability of patent and trademark data to patent examiners, trademark attorneys, the general public and foreign patent and trademark offices in the event of a disaster resulting in the complete or partial destruction of the USPTO's single data center.

If there were a disaster or catastrophic failure at the USPTO data center, it would take months to restore the over 200+ terabytes of critical data and to rebuild all of the servers and networks that provide access to the data. The USPTO estimates that the potential lost productivity cost of a catastrophic disaster at approximately \$320 million in FY 2004/FY 2005 dollars. Another factor that cannot be dismissed is the significant loss of a less tangible commodity – the confidence placed by the inventors both at home and abroad in the Intellectual Property (Protection) system of the United States. It is critical that the



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OCIO be able to provide data, server, and network replication following the complete implementation of the Disaster Recovery (DR) Plan.

As a result of the initial planning and assessment studies, USPTO has determined that establishing a second data center in a live operational mode is the best approach. The second data center will reside in a different location from the Alexandria Headquarters with real-time data replication capability. The ability of real time data replication to the second data center enables USPTO to split the production load amongst the two data centers, each fully configured to and capable of assuming each others data center's production load should one data center experience disaster related outage.

The USPTO is proposing a phased implementation for the second data center. The phases would enable the USPTO to start with protecting its most critical assets – patent and trademark data. Through an evolutionary process this phased implementation will support disaster recovery capabilities in the event of a disaster at the USPTO primary data center and eventually a second load-balanced data center operations. Each phase supports the evolution toward the goal of dual data center operations.

The phased implementation strategy follows widely accepted industry best practices for the phased implementation of E-Gov load balanced operations. The phases would enable the USPTO to start with protecting its most critical assets – patent and trademark data. Through an evolutionary process this phased implementation will support disaster recovery capabilities in the event of a disaster at the USPTO primary data center. Each phase supports the evolution toward the goal of dual data center operations. The implementation strategy is to deploy the business continuity initiative in five phases as summarized below:

- Phase 1 – Critical services and associated applications required to provide business continuity operations were identified. In addition, the criticality, sensitivity, and the support of each application to the core business functions were assessed. AIS recovery priority lists have been compiled for each of the Line of Business along with the associated list of dependent/impacting relationships with other AISs;
- Phase 2 – Implement network connectivity from a DR location to the USPTO and implement and implement DR capabilities for five of the currently identified 20 mission critical (Priority 1) USPTO applications;
- Phase 3 – Implement DR capabilities for an additional 10 mission critical (Priority 1) USPTO applications;
- Phase 4 – Implement DR capabilities for the remaining mission critical (Priority 1) USPTO applications and 10 of the currently identified 35 business essential (Priority 2) USPTO applications;



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- Phase 5 – Implement DR capabilities for the remaining business essential (Priority 2) USPTO applications;
- Phase 6 – Implement data replication for Priority 3 applications and implement server load balancing for mission critical and business essential applications where possible; and
- Phase 7 – Continue server load balancing for Priority 1, 2, and 3 applications and continue improvement of business continuity operational readiness.

In general, the phased implementation would provide servers to restore replication services in accordance with recovery requirements as defined by business need. Network connectivity will be initially built to provide both data storage and network capabilities for replication of critical business data and access to the application services. Network capabilities will also be enhanced as necessary to support access and restoration of business services and data.

b. Commitments and Benefits

The proposed business continuity plan will meet the needs of the customer and staff by protecting the most critical asset at USPTO – patent and trademark data. The phased implementation will establish a foundation for the ultimate long-range plan that step-wise process that would provide information asset protection for high priority applications. The USPTO will be able to continue operations supporting U.S. and worldwide customers and USPTO staff that are the users of USPTO services.

In addition, the primary benefits of the business continuity plan are improved efficiencies and cost avoidance. One of the most significant lessons learned from September 11th is that an organization's ability to recover from a similar disaster is primarily based upon the availability of its data. USPTO estimates a cost of almost \$550 million to work off the 47-month production backlog that would develop for Patents as a result of a disaster resulting in the loss of operations in the CPK2/11th floor data center.

Essentially, it would take approximately twelve months to restore full operations. This includes provisioning a new data center, reconstructing the network, acquiring servers and storage, and restoring all applications and application data. In the event that we could not successfully recover these files from tape, it would be a huge undertaking to restore patent grants and trademark registration data from the paper copies stored at our Boyers, Pa. remote site. In addition, we would have to request a resubmission of all patent and trademark applications that were in process at the time of the disaster that could not be located in paper form. Notwithstanding the fact that if the worst of fears were to be experienced, a significant number of staff replacements would have to be taken into account. In addition, the loss of critical systems would cost the USPTO over



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\$7 million a day in lost revenues, not including the loss of productivity costs for over 8,000 employees, and while exacerbating the backlog in trademark and patent pendency. The successful implementation of the business continuity plan will help to preserve the vital business processes of USPTO in the event of a disaster. This would be accomplished by adding IT technology recovery procedures, equipment, and capabilities through a phased implementation aforementioned. In general, business continuity represents the uninterrupted and reliable delivery of services to USPTO employees and customers. This process involves the review of all server and storage infrastructure to optimize the utilization of the software and hardware while ensuring that all critical services are delivered on infrastructures, which will support load-balanced operations.

1.3.3 Corporate Support Services

The USPTO is highly dependent on IT to conduct its corporate functions. The IT Corporate Support Services ensures that the daily business of the USPTO continues unabated. The systems that are available support specific activities, such as USPTO lease and building construction projects, reliable information scanning, system support, facilities management, and other important business that is managed at the corporate level. The systems that provide corporate services include Computer Aided Design System (CAD), Enterprise Asset Management System (EAMS), IT Facilities Management System, and the Office Administration Services Request System (OASRS).

1.3.3.1 Computer Aided Design System (CAD)

a. Description

The Computer Aided Design System (CAD) enables the Office of Administrative Services to better manage the USPTO lease and building construction projects. Implementing the ARRIS CAD/Consolidation database on PTONet has permitted centralization of facilities data, engineering drawings, USPTO Consolidation data, and administrative back-up procedures. The Alexandria Headquarters facility is managed by an AutoCAD implementation. Dual support will be needed until the USPTO is completely out of current facility leases.

b. Commitments and Benefits

The CAD fulfills the commitment of customers and staff by enabling a true depiction of space usage to develop the space plans, and retains the plans in electronic format. Space design work will be upgraded in the future to comply with GSA standardization efforts in building management that will further enhance facility resource management. The benefits from this system consists of improved resource utilization planning, reduction in paperwork, effective space allocation, and cost management. In addition, facility information can be exchanged with GSA in the same format and medium to expedite and improve oversight and management understanding and approvals.



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1.3.3.2 Enterprise Asset Management System (EAMS)

a. Description

The EAMS is a COTS system of integrated modules that enable the USPTO to manage and track its automated hardware and software assets through such functions as Critical Problem Notification metadata capture, tracking, and reporting. The USPTO's current inventory lists more than 45,000 IT hardware assets and more than 800 COTS software products. In addition to accounting for the location of these assets, USPTO must be able to track their current operational status as well. EAMS permits managers to track the location of all hardware used by the USPTO and allows development managers to track the change management status of any software for which change is pending on one of the USPTO's physical (hardware) assets. Additionally, EAMS permits automated recordation and tracking by the USPTO Help Desk of system problems reported by system maintenance teams as well as the users of the asset. This system supports the relocation project by tracking all assets as they are moved to the Alexandria Headquarters.

Future enhancements to EAMS include the capability for managers to plan and track the deployment and upgrade of new and existing assets. Inherent in this enhancement will be the ability for property custodians to view custody records for their equipment on-line. All property management reporting and certification will be automated with real time reports. The current EAMS handheld asset management data collection devices are obsolete and will be replaced with updated equipment and software. The existing interface with the Enterprise Management System (EMS) will be expanded to generate more problem records that will result in faster resolution of problems and improved service. EAMS will be integrated to the Automated Call Distribution System permitting help desk callers to be automatically identified thereby accelerating the process by which service is provided to the caller.

A proof of concept prototype and a follow up pilot program will be implemented using Radio Frequency Identifications tags (RFID) on all assets in the EAMS Asset Management module. The RFID contain a unique identifier with asset dependent information to track initial equipment receiving at the warehouse to deployment, moving, routine property custodian certification, to final surplus processing by reading the RFID with replacement handheld devices. This technology will reduce data scanning errors, expedite the certification process, and improve the management of the IT inventory at USPTO. At least 15 new RDIF handheld will be used during the prototype period with another 100 units added in the following year for use at the Asset Management support staff. Another 175 units are planned in FY 2008 for Asset Certification use by Property Custodians.



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In addition, the Information Technology Auto Discovery System (ITADS) will automatically identify the software, hardware, configuration file, and network devices information from all major platforms. This information will be stored in a central Oracle database and enable the decision-maker to plan enterprise upgrades, rebuild the enterprise after a disaster (at the management level), optimize end-user productivity, reduce total cost of ownership by enforcing desktop standards, improve support services, and generate unlimited ad hoc reports for review as well as tracking hardware and software changes and needs. The ITADS will use Commercial-Off-The-Shelf (COTS) product for automating the discovery of hardware, software, and configuration files of each NT workstation, NT server and Unix server in the USPTO enterprise. ITADS provides the following capabilities for the enterprise asset tracking system:

- Complete enterprise-level asset tracking system that can discover, store, and report detailed asset information for USPTO;
- Automatic discovery of the hardware, software, configuration files on independent platforms (Window NT/2000 server, HP-UX, SUN SPARC Solaris);
- Easy-to-use graphical interface for data analysis and retrieval, such as Asset Viewer, including the Analyst, Report Clerk, Auditor and Desktop Guru;
- A tool for the administrator to create user-defined tables, delete existing tables, and manage assets;
- Identification of all currently installed hardware and software throughout the enterprise, plotting historical trends, and projecting future asset changes in order to make beneficial decisions about hardware and software assets;
- Verification that the enterprise has the hardware and software resources necessary to maintain optimal productivity;
- Reports regarding system assets from a network management perspective, with the goal of proper allocation and optimal usage of resource;
- Monitoring system for installed software to gauge the number of necessary licenses; and
- Automatic discovery of the network devices that respond to SNMP commands, such as bridge, router, hub, and switch.

b. Commitments and Benefits

The EAMS is an IT infrastructure function that supports all business areas as well as IT infrastructure. The Enterprise Asset Management System enables the USPTO to



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maintain current business production, improve and enhance current business and IT infrastructure, and migrate AISs to operate on an evolving infrastructure. Key benefits include:

- Improved desktop service support through improved knowledge;
- Enabling the CIO to better anticipate and plan for employee and customer needs and problems, and manage future changes through the use of a historical base of knowledge about the management of IT resources; and
- Providing a superior level of support to its employees and customers by tying business information to the IT resources that support the mission-critical application.

1.3.3.3 IT Facilities Post Relocation Space and Construction Activities

a. Description

Since OCIO will be taking possession of three new IT-intensive spaces at Alexandria Headquarters, the Data Center, the Lab, and the Edison Room, it can be presumed that additional, follow-on space/construction type activities will be required after OCIO has been relocated. Indications from the Office of Space Acquisition are that such follow-on activities will not be addressed through the Space Consolidation Budget and, therefore, organizations should plan and budget accordingly and appropriately.

When viewed in total, USPTO needs to accommodate follow-on space/construction activities within the Alexandria Headquarters Data Center, the Lab at Alexandria Headquarters, and the Alexandria Headquarters Edison Room immediately after OCIO completes relocation and begins operations within these new facilities.

b. Commitments and Benefits

Follow-on space and construction activities support the USPTO in meeting service commitments to its customers. Once the relocation to the Alexandria Headquarters has been completed, additional work in the IT facilities will ensure that the systems and networks will continue to operate in a facility that can adequately support them. This investment will minimize the impact that an ill-equipped facility would have on daily operations at the Alexandria Headquarters.

1.3.3.4 IT Facilities Management System (ITFMS)

a. Description



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The IT Facilities Management System (ITFMS) provides the capability to create and modify IT facility information in an electronic form, including drawings and data. The ITFMS will enable the OCIO to accurately and expeditiously produce and view facility information within eight hours of the most recent change. The system will employ a commercial off the shelf-automated tool that will provide information regarding the Production Data Center.

ITFMS depicts the configuration in terms of equipment in the USPTO Data Centers, Emerging Technology Center (ETC Lab), Dissemination Data Center and Network Operation Division. It is essential for the recovery from catastrophic events and for planning for major relocations. ITFMS allows for forecasting environmental conditions in the facility and enhances safeguarding of assets contained in the facility. ITFMS also makes accurate facility information available electronically to authorized individuals and tracks information related to the coordination and approval of facility modifications as well. Future enhancements to this system although not contemplated for the initial release, include the following: (1) Communication rooms/closets (2) Boyers Data Center (3) Dissemination Data Center, and (4) Enterprise Call Center Room.

The system will adhere to the following principles of facilities management:

- Every IT Facility has an assigned IT Facility Manager;
- Each IT Facility Manager is responsible for performing the three basic duties and responsibilities for his/her assigned facility as identified below;
- Coordinate and approve all modifications of the facility: changes to physical infrastructure; changes to signal and electrical wiring/cabling; changes to hardware equipment (i.e., new installations, relocations, reconfigurations, removals for repair, surplus designations, etc); changes to maintenance coverage on hardware;
- Forecast and monitor environmental conditions of the facility;
- Safeguard assets contained within the facility in accordance with USPTO asset management policy;
- Each IT Facility Manager is responsible for ensuring that all electronic information regarding his/her facility is not outdated by more than 8 hours;
- Each IT Facility Manager is responsible for maintaining the interface between OCIO's IT facility management process and USPTO's asset management process to ensure compliance with asset policy; and



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- Office of Technical Plans and Policy (OTPP) provides support to each IT Facility Manager and maintains the official records for OCIO's IT facilities.

b. Commitments and Benefits

The ITFMS will provide rapid and systematic information regarding the status of equipment and the physical infrastructure of the IT facilities that are monitored. Specifically, ITFMS will provide the following.

- **Equipment Documentation**: ITFMS will document the physical location of devices with connectivity and tracking asset information;
- **Provide Basis for What-if Planning**: Provide color-coded drawings of data centers with resident equipment to facilitate "what-if" planning; and
- **Report Generation**: Provide status and location of all equipment current to within eight hours of the most recent change to the IT Facility.

The ITFMS will provide the following benefits:

- Accomplished growth objectives by scaling the technology infrastructure;
- Improved customer satisfaction through reduction of downtime;
- Effective response to business events with technology-driven projects;
- Better financial decisions as a result of more readily available technology asset information; and
- Increased operating efficiency with better change management processes.

1.3.4 Enterprise Office Automation System

Office Automation projects enable the USPTO to maintain current business production, improve the quality of service, and migrate AISs to operate on an evolving and modernized infrastructure. Systems within this initiative include mail routing, newsgroup services, and web services. The maintenance of software license agreements is also managed under this activity.

1.3.4.1 Desktop Software Licenses and Maintenance

a. Description



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The software licenses are maintained to enable end-users to operate the software for their daily responsibilities. The types of software licenses range from Microsoft Desktop Configuration agreements to Norton Utilities. The licenses are necessary to enable enterprise-wide usage of these applications.

b. Commitments and Benefits

The commitments to the customers and the staff are being met by ensuring that they have use of the software applications and network access through purchases of additional licenses or renewals. Depending on the software license agreement, end-users can perform the required tasks by using software applications. The benefit from this activity is allowing users to have access to software applications, network access, workstation, and other IT desktop resources to conduct their daily business.

1.3.4.2 Office Automation Server Administration

a. Description

One of the key aspects of this project is to operate and maintain the USPTO's exchange and public folders utility that allows users to send and receive electronic mail among USPTO employees and the Internet community. Exchange also enables users to send and receive encrypted digitally signed messages within the organization. Exchanges Public Folders utility provides the USPTO with general announcements, flyers, and organizational information. The users can post their own announcements in a forum environment, including calendar functionality that allows USPTO personnel to coordinate and schedule activities, meetings, and tasks.

In addition, there is centralized server support for a large number of mission-critical business and office automation applications. The centralized support entails daily operational management of more than 100 network and office automation file NT servers and 385 network printers, and Unix servers in support of the Enterprise Wide Login (EWL) system, PKI, and external mail gateways. USPTO Windows NT domain is also supported. Windows NT allows the servers and clients to communicate with each other, perform network file and print services, provide server based application troubleshooting capability, and restore server operations. Microsoft Systems Management Server (SMS) is also maintained through server administration, which allows server and desktop configuration management, remote workstation operation, and automated software distribution. Additional functions include ensuring connectivity to business area systems, fault management, performance management, capacity management, and Network Operating System security. Office automation servers have ongoing hardware replacement on a 3-year cycle, and provides for a cost effective network-attached storage system through redundancy and capacity expansion.

b. Commitments and Benefits



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This activity satisfies the commitments to the customer and staff by offering internal and external email delivery, public folders, system event notification, clear central desktop security policies, high performance servers, increase in reliability, centralized server support, and administration and operational support for new systems. The servers are also expandable, handles technology refresh, and provides PKI. The benefits gained from the server administration include: (1) production capability through the use of email communication; (2) rapid response to outages; (3) site wide information dissemination; (4) enhanced desktop security; (5) increase in workload capability; (6) uniform desktop configuration support; and (7) increase in server uptime.

1.3.4.3 Workstations

a. Description

An important aspect of Workstation project is the acquisition and deployment of the new microcomputer desktop and laptop operating system and the office automation suite. The USPTO has elected to standardize on the COTS software promulgated by Microsoft, i.e. Windows and Office respectively. The rapidity of releases and the need to ensure that all internally developed packages will continue to function after deployment of the COTS packages precludes implementing every new operating system and office automation suite. To ensure continuing compatibility the USPTO implements concurrent alternating releases of the operating system (Windows) and the office automation suite (Office). By deploying compatible packages the USPTO is assured that the operating system and the office automation suite will function well together and that the AIS packages will only have to be modified to match one level of COTS rather than being concerned with potentially conflicting packages.

The development and use of "To-Be" architecture, and will continue to be, of paramount importance to achieving efficient USPTO business processes. The OCIO will continue to investigate and, as necessary, implement various hardware and software technologies that are emerging from industry to take full advantage of the advances in IT. A critically important enterprise function is desktop configuration testing to make sure that there are no conflicts between applications running on the desktop workstations and that new applications can be loaded via the network without disrupting the previously installed applications. A key component of the Workstations activity is to replace outdated desktop Central Processing Units (CPU) at or near the end of the three-year cycle. In addition, services are provided for in-house troubleshooting of desktop problems, by diagnosing failed equipment and software.

b. Commitments and Benefits

Workstation projects support all business areas as well as AIS development projects. Workstation activities enable the USPTO to maintain current business production,



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improve the quality of service, and enhance current business and IT infrastructure, and migrate AISs to operate on an evolving and modernized infrastructure. Periodically modernized desktop workstations will provide benefits to customers and staff by:

- Saving time and money by replacing older CPUs which are no longer under warranty and are more-susceptible to problems which cause costly downtime for Patent Examiners, Trademark attorneys and other USPTO employees;
- Providing employees with current desktop CPUs to handle the resource intensive PTO COTS and AIS software - such as the E-Gov suite of applications - to maintain business production capability in an environment of increasing workloads;
- Ensuring that Physical security prevents theft/lost workstation/peripheral assets;
- Preventing the PTO of costly, older equipment, aids in cleaning up the Asset Mgmt database so it represents more of an active inventory of CPUs at the PTO and ensures sensitive data is sanitized from CPUs prior to surplus to protect the PTO's intellectual property;
- Preparing PTO to successfully attain E-Gov goals in an increasing workload environment by providing robust CPU memory and processing capability necessary for AIS and COTS software; and
- Reducing support costs associated with the standardized environment promoted by the CPU Replacement Program (CRP) that results in less variance in the hardware and software that must be maintained.

1.3.5 Data Management Services

USPTO enterprise-wide data management services are aimed at providing clear, concise, consistent, unambiguous, and easily accessible business data throughout the USPTO and in applications shared throughout the worldwide intellectual property community. The data management program addresses such data requirements as accuracy and timeliness; improved management decision making through better access to more accurate and timely data; increased productivity in the information collection and processing activities as the understanding and use of available data increases; existing data shared to the maximum practicable extent, cost avoidance of redundant data collection and storage; and reduced cost of system maintenance and time needed to modify implemented systems by designing more stable and flexible data bases.

In the past at the USPTO, each business area defined data without regard to an enterprise-wide view. This has changed. The USPTO has in place policies for data management and data element standardization. Much of the USPTO's data relied on to make accurate



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decisions are modeled to support reuse, and data definitions are standardized to support data sharing at the physical level.

The components of a strong data management program to support USPTO decision making and operations include an enterprise data model, standard data elements, technical design naming conventions, an enterprise information repository, a data quality improvement and monitoring function, a data stewardship project, management of XML assets through the repository, and support for UML.

- The enterprise data model is complete, with validation and the addition of details to occur over the next fiscal year. This model exists, in part, to support reuse of system development work. The development of data models for business areas continues to support systems development, always drawing from the data in the enterprise data model. Once completed and validated, subject areas in the enterprise data model will be continuously modified based on data requirement changes to USPTO business practices, and as defined in the future expansion of automated systems. As the USPTO migrates systems from the current Information Engineering methodology and tools to an Object Oriented methodology and tools, the enterprise data model will be migrated and realigned. Data management policies and procedures will be updated to support the Object Oriented methodology. The enterprise data model will be used as the starting point to develop the Data Reference Model (DRM) under the Federal Enterprise Architecture (FEA);
- Data modeling and standardization support reengineering of the USPTO business processes. Data modeling identifies the information needs of an activity. Data modeling is a communication tool that provides an accurate understanding of the data required for the USPTO to conduct its business. Model-based data standardization will continue to reduce redundancy, facilitate single-point-of-entry of data, and provide for the reuse of data. An important activity is mapping physical and legacy data elements to standard data elements to enhance data understanding and sharing, which is accomplished through the information repository. Metadata (information about data) management is being perfected through optimum use of repository tools and procedures. As AIS development efforts increase, data modeling and standardization support will be continuously expanded to identify new, sharable information. The new sharable data then will be defined, modeled, and standardized to promote data sharing;
- Technical design data naming convention is a set of rules for naming the physical design data elements such as table, columns, foreign key columns, primary keys, indices, and referential integrity constraints. Enforcing a consistent data naming structure from system-to-system minimizes the development effort to create and maintain physical data and promotes data sharing USPTO-wide. Logical and



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physical data elements of a project are linked through its (Oracle) database in the Enterprise Information Repository;

- The data quality program is institutionalized. Its purpose is to measure the USPTO's ability to convert data into mission-critical information and correct any problems, such as compliance to business rules that govern data. The data quality program strives to enforce a data quality management process that systematically conducts audits, sets up monitoring systems, and certifies business critical data. This will improve the quality of information upon which business decisions are made and enterprise performance is reported. The data quality program is driven by current business projects. New information systems that are designed with proven, high quality data receive better feedback from users when the system is delivered. Delivering and maintaining quality data supports major USPTO goals of data sharing, interoperability, and re-use;
- A data stewardship program has been initiated to achieve full data management maturity at the USPTO. The mission of the Data Stewardship Program is to work directly with business users to establish policy and define responsibilities to promote reliable information throughout the USPTO. The objectives of the program are to ensure that data is correctly identified and defined from not only a business perspective but from an enterprise perspective. The enterprise perspective relies on coordination of data requirements across business areas or system boundaries along with conflict resolution. This coordination ensures that the data used across business areas or systems is consistent, useable, and reliable for all business users. The Data Stewardship program promulgates the concept that data is a valuable corporate resource and as such it requires management encompassing its creation, use, protection, documentation, change, and disposition. The Data Stewardship program defines three levels of data steward for USPTO business information: Business Area, Operational, and Technical Data Stewards. Designation of data stewards allows the data management program to perfect the definitions of data and ensure that data is used correctly and is properly secured. The data stewardship program will be revised to align with the Business and Data Reference Models on the FEA. In FY 2000, an initial program overview and introduction was conducted at the Trademarks Data Quality Project Training Seminar. The Data Stewardship team conducted a series of management briefings in FY 2001 to several organizations under the OCIO and business users, introducing the concept of achieving data quality through a data stewardship program. Several data stewards meetings were conducted shortly after the briefings to identify the associated data stewards for the Patent data. In FY 2003 the Trademark business users, along with the Trademark and Electronic Government Business Division and Data Administration Division under CIO met to identify the associated data stewards for the Madrid Contracting Parties. The necessary changes to the USPTO's central repository and Application Clearinghouse are being addressed so that the three levels of data stewards can be



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documented. In FY 2004-2005, the Data Stewardship team will start to re-evaluate the assignment of data stewards on 852 existing Standard Data Elements;

- The USPTO has developed concepts and systems to support the filing, examination, publication, and archival storage of intellectual property documents in electronic format using XML. To facilitate the implementation of these concepts and systems, the Office of Data Architecture and Services developed a XML Resource Repository Program that establishes effective configuration control of the USPTO's XML assets, including Document Type Definitions (DTDs), schema, entities, style sheets, and document instances. The XML Resource Repository is comprised of two separate parts: the XML Product Library and the XML Tag Data Base. In FY 2000, a Technical Note was prepared, outlining the procedures for managing the SGML/XML Resource Repository. The technical note was approved by the SEPG in FY 2001, making managing the XML products an official function of the Office of Data Architecture and Services. The document provides guidance to the XML developers on naming conventions for the XML tags and products as well procedures on how to upload the DTDs to the repository and reuse approved DTD products. There are 85 DTDs imported from the Patent, Trademark, and Dissemination business areas into the Product Library. The tag information associated with these DTDs is captured in the XML Tag Data Base, providing a linkage between the AISs' physical information that is being implemented, to the logical standard data elements. Tagging information from other business areas will be collected as development projects are initiated. In FY 2001, realizing the limited functions of the current XML repository, the Office of Data Architecture and Services worked in tandem with the Office of Information Dissemination Services to research and select the appropriate XML tool. XML Cannon was chosen as the tool of choice to manage the USPTO's XML products after a productive market research. XML Cannon was presented to the SEPG and incorporated into the USPTO's Technical Reference Model. A justification paper was prepared, analyzing the need to move the DTD products and tags from the XML existing repository to the XML Canon. Shortly after the tool was approved, DTDs from EFS, EPCT, Red Book, and MPEP were uploaded into the XML Canon Repository. The establishment of an international agreement for the electronic filing of patent applications under PCT (PCT AI Part 7 Annex F) and the adoption of the Madrid protocol for Trademarks represent commitments from the USPTO to adopt and adapt to agreed upon XML resources. They also represent agreements to implement certain aspects of XML in specified ways to ensure maximum interoperability of documents and data files between Patent and Trademark organizations. With the present structure of the XML Technical Working Group, the Data Administration Division, and the XML Technical Note, the USPTO has the ability to enforce these commitments across the enterprise; and



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- The UML is a flexible and comprehensive way to design and diagram any software development project. It is a language for specifying, visualizing, constructing and documenting the artifacts of software systems, as well as for business modeling and other non-software systems. With the increasing popularity of Web applications using object-oriented techniques at the USPTO, the UML will become a new standard modeling language for software systems. The Office of Data Architecture and Services is positioning itself to support the UML to assist Web developers in modeling their Web applications as a part of the complete system and the business logic that must be reflected in the application. The Data Administration Division along with the Center of Excellence is testing a third-party tool that can be used to convert the current ICASE data models into Rational Rose models.

1.3.5.1 Data Base Administration

a. Description

Data Base Administration operations support a complex and large IT environment that provides mission-critical information across the USPTO in support of all business applications. The staff is highly skilled and organized to support this complex environment. The maintenance of the Oracle data base management system software is a key component of this project in addition to difficult data base troubleshooting exercises, for nighttime and weekend data base monitoring and backups. To a smaller extent, mass storage capability will allow experimentation with new Oracle releases and to develop a small-scale database tracking system.

b. Commitments and Benefits

Data Base Administration provides a reputable and reliable standard data base management system (Oracle) with the ability to easily maintain the data base management system and upgrade it in a complex environment. This efficiency enables continuous improvement in service quality and reliability. Support for database administration is also enhanced regarding nighttime and weekend requirements for backups, data base monitoring, and implementation of changes. As a result, the benefits are as follows: (1) ensure that a very critical USPTO asset – data – is available whenever needed to support all USPTO business areas; (2) meets business requirements for information excellence; (3) fulfills business requirements for data quality and reliability; and (4) supports business customer requirements for high availability of supporting systems. The implementation of security controls is a recent effort requiring a strong commitment of data base administration resources.

1.3.5.2 Data Management

a. Description



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USPTO Data Management operations ensure that data is treated as a valuable resource and that it follows sound solution architecture principles, while enhancing our mission-critical systems. These data management activities are aimed at providing clear, concise, consistent, unambiguous, and easily accessible business data throughout the USPTO and in applications shared throughout the worldwide intellectual property community. The operational activities in support of the USPTO's Data Management program include maintenance of our robust enterprise data model, standardization of USPTO data elements, a data quality improvement and monitoring function, support for data stewardship, management of XML assets through the repository, and over arching support for UML. FY 2004 and outer years increases are attributable to support of the 21st Century Strategic Plan and its critical projects, especially Patent and Trademark e-government initiatives, portal strategies, and customer management; to ensure data quality activities occur, and to facilitate data integrity in data base design and data sharing among projects as the USPTO moves to an object-oriented methodology and to develop and leverage the Data Reference Model (DRM) under the Federal Enterprise Architecture.

b. Commitments and Benefits

The USPTO-wide data management program supports the macro policy performance goal of helping to protect, promote, and expand intellectual property rights systems. It accomplishes this by protecting and leveraging a very critical asset – data. This is a Corporate Support commitment employing the strategy of effectively managing resources as well as leveraging information technology. Benefits of the data management program are as follows:

- The program establishes database design policies and procedures that promote data integrity, reduce data redundancy, facilitate single-point-of-entry, and promote reuse of data;
- A viable data management program helps achieve the goal of delivering quality software products when promised and within cost estimates by working with the development teams early in the Life Cycle;
- Standardizing and using standard data is an enabler for making processes reusable and sharable across the USPTO. System development and maintenance are supported and expedited with a common starter set of data elements culled from the repository. Standardization also supports data sharing and enhanced data quality;
- Enforces logical and physical data naming conventions in AISs data element development efforts. Use of consistent data element names supports business policy to treat data as an enterprise-owned asset. Having data element names



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clearly defined establishes the groundwork to minimize data redundancy, increase data sharing, and improve data quality;

- Data sharing reduces storage costs and facilitates more efficient systems development;
- Enhanced data quality occurs when the meaning and characteristics of data is totally unambiguous. The user then has a higher level of confidence in the data;
- Creates a central focus for a data quality awareness program;
- Assigning data stewardship roles to the AIS business users and OCIO staff ensures data is correctly identified and defined from both the business perspective and the enterprise perspective;
- Providing an effective procedure to create, exchange, and maintain XML resources (i.e., DTDs, schemas, entities, style sheets, and document instances) by utilizing existing data elements from the XML Repository supports data sharing;
- Monitoring data quality at key points ensures that the data will support USPTO Information Requirements; and
- Supporting UML to assist developers in modeling their Web applications as a part of the complete system along with the business logic and promoting the shareable objects and methods to maximize their reuse.

1.3.5.3 Database High Availability

a. Description

The availability of database information to customers and staff is critical for USPTO AIS. This project allows deployment of database systems for Patent and Trademark business areas, thereby, leveraging high availability technologies to support E-Gov projects. In order to deliver this function, the USPTO additional Oracle software licenses are needed to support Oracle High Availability Database capabilities. The current Oracle licenses held by the USPTO allow all USPTO employees to access Oracle databases. The USPTO must acquire additional Oracle licenses in order to support E-Gov projects and to continue unlimited Internet access to Oracle databases.

b. Commitments and Benefits

The commitments to the customer and the staff are being met by enabling robust database systems to supply critical data. This effort is achieved through database consolidation



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and high availability of database systems. The progress being made in E-Gov is also attributable to readily available database systems with low failure rates. In addition to these commitments, the benefit is that the customers and staff have readily available access to critical information from database applications regardless of hardware or software failure.

1.3.5.4 Electronic Records Management (ERM)

a. Description

The USPTO Electronic Records Management (ERM) program is a comprehensive set of activities to keep machine-readable information human interpretable for as long as the business area requires access to that information. The current model of distributed records management and record stewardship of paper by the business areas will be expanded to include electronic records. The envisioned system will provide a pointer to the information that already exists in the respective business areas' Automated Information Systems and capture only mandatory metadata related to electronic record keeping function. The system will not replicate any electronic records or metadata that are currently captured and managed in the AISs.

The ERM program provides a standards-based approach to managing digital records electronically by storing metadata about a record but leaving that record in its native repository. This practice will enable intellectual control of USPTO digital records without requiring physical custody. The ERM program allows the agency to meet the Government Paperwork Elimination Act (GPEA) requirement of having a record keeping system for records maintained in electronic form.

In order to comply with GPEA, USPTO must also develop a recordkeeping system for records maintained in electronic form. Architectures to support the business area uses of electronic records will be defined commensurate with business practices. The current focus is the support for strategic planning and efforts to establish empirical evidence for the USPTO conceptual model for electronic record keeping, as well as practical implementations on discrete AISs. USPTO will formulate an approach regarding how electronic records management should be applied and how system developers should be trained to incorporate electronic records management within their individual systems. Current software funding is used to acquire a Commercial-of-the-Shelf (COTS) application that supports the recurring needs of the ERM program and fits within the framework of the Technical Reference Model.

b. Commitments and Benefits

The ERM program supports the USPTO's 21st Century Strategic Plan by enabling greater productivity through shared access to official records; increased capability through implementing a Vital Electronic Record Archive; and increased agility by not forcing a



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one-size-fits-all electronic records management solution on all electronic records. The program accomplishes these commitments by protecting and handling efficiently a very critical asset—the records that contain our data in electronic form. This is a Corporate Support commitment employing the strategy of effectively managing resources as well as leveraging IT. Benefits of an electronic records management are as follows:

- Compliance with GPEA requirements by providing ease of access of records within USPTO business areas and to public customers;
- Disaster recovery support and systems management, critical to ongoing USPTO operations;
- Coordination of properly approved disposition of records, including transfer to the National Archives and Records Administration. This procedure supports efficiency in USPTO operations;
- Better dissemination of knowledge of electronic records management and best practices to the records stewards and business users, to promote efficiency and quality in USPTO business operations;
- Improve access to important records. Important functional electronic messages and documents are easily saved and retrieved with standard records management procedures in place, the driving goals of the USPTO's records management program. This improves efficiency of business operations, ensures that individuals other than the creator can more readily retrieve electronic records, and ensures that electronic records are managed as a business asset;
- Methodically storing electronic records, archiving non-volatile electronic records, and disposing of electronic records accordance with an approved retention schedule reduces overloaded hard drives and shared drives. It enhances the ability to use automated systems effectively, and minimizes the extraneous electronic information that would otherwise need to be reviewed;
- Improved Work Environment: The physical surroundings of USPTO staff will be improved as the need to retain papers copies of documents are eliminated from desks, floors, and file cabinets. The space currently occupied by paper could be better used. The work area will be cleaner, and generally more esthetically pleasing;
- Cost Savings: The cost of storage and retrieval of paper copies of records should decrease as the electronic record keeping function is implemented USPTO-wide;



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- The roles and responsibilities for effectively managing electronic records are clearly defined, which provides direction to relevant USPTO areas and helps ensure that the needs for effective management of electronic records are met;
- The program collaborates with the USPTO IT organization to identify and provide records management direction on methods to protect the enterprise's electronic vital records, which include those records that are required to continue operations after a disaster or that establish the financial or legal rights of the USPTO, its employees or intellectual property stakeholders; and
- The program identifies confidential electronic records and collaborates with the USPTO IT organization to outline acceptable practices to protect the information in these records, which heightens the employees' awareness of the confidential nature of the electronic records and establishes a framework for protecting the works of intellectual property stakeholders.

1.3.5.5 Enterprise Data Quality Tool

a. Description

The Enterprise Data Quality Tool suite consists of the Quality Manager and dfPower Studio tools. These tools, as part of the TRM and integral to data architecture, are being used to assist the Data Administration Division staff, along with the developers and business users, to measure the level of compliance between data of a physical database and the business rules that define that data. The benefits of using these tools include pinpointing opportunities for data quality improvement, improving information quality for both internal and external customers, and reducing the proliferation of poor quality data. The tools are vital to supporting USPTO and OCIO values concerned with quality improvement, to guaranteeing regulatory compliance by ensuring business rules are enforced at the data base level and to avoiding costs associated with poor quality data.

b. Commitments and Benefits

Both the customers and staff have access to complete and accurate data by conducting quality assurance tests using the Enterprise Data Quality Tool suite. This data quality tools can perform data validation for completeness and validity, analyzes domain data, assesses the integrity of the database structure, identifies and removes redundant data, and validates address information. These types of data quality management allow the USPTO to enforce business rules compliance and assist in the transformation of compliance rulemaking. The benefits associated with this effort has constructive outcomes such as (1) ensuring the proper usage of data values in USPTO mission-critical systems; (2) ensuring that mandatory data is captured and valid data is used in USPTO mission critical systems; (3) ensuring that records are unique and the cardinality between records are correct; (4) ensuring regulatory compliance by enforcing the business rules at



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the database level; (5) certifying that data from source system was successfully moved to target system; (6) minimizing multiple source updates and potential for errors as well as saving storage space; and (7) minimizing inaccurate address information and removing duplication from the Address database, allowing the USPTO customer experience a positive one.

1.3.5.6 Enterprise Information Repository

a. Description

The Enterprise Information Repository, a critical component of the USPTO's enterprise architecture, supports quality and process improvements in USPTO's core business functions. The Repository provides a mechanism to centralize, manage and standardize USPTO information resources and metadata, thereby, representing the primary means for managing and sharing information from the USPTO's diverse information environment. The metadata comes from many disparate data stores and tool repositories in a central location; this linkage has great business value by allowing business users to see the relationships between the "islands" of metadata using one tool with an interface specific to their needs. This interface eliminates the time consuming practice of opening several different tools to gather the bits of information from each data source to formulate the desired result by having the information readily available from one source. The USPTO has adopted the Rochade repository tool as the standard information repository tool. Rochade is a specialized network-centric data base management system that controls the information flow within the application development environment. This application controls and integrates platforms, models, artifacts, tools, techniques, methodologies, people, and projects. These elements are analyzed and defined within its repository information model (RIM), which generates the specialized schematic that drives the repository database. Rochade is an extensible and scalable application for metadata storage and manipulation.

b. Commitments and Benefits

The Enterprise Information Repository meets the commitments by allowing users to: (1) manage and share information from the USPTO's diverse information environment; (2) integrate and track USPTO data standards; (3) determine data items for inclusion in the Enterprise Data Model; (4) perform impact analysis; (5) facilitate data model reviews; (6) manage logical to physical data mappings; (7) facilitate metadata management for the Enterprise Data Model; (8) provide robust user support and maintain custom applications; (9) perform administrative and operational support; (10) manage and share information in the AETS' Application Clearinghouse and support concurrent technical review; and (11) provide the ability to integrate model-based architecture.

In addition, the following benefits allow users to (1) establish an easy method to disseminate USPTO information assets by eliminating the time consuming practice of



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opening several different tools and platforms. Many disparate data stores are related in a central place for a more complete picture of the USPTO data and applications environment; (2) adhere to data standards, in alignment with USPTO policy. Data standards are centrally maintained and readily available to data modelers and developers; (3) increase opportunity for data sharing, in alignment with USPTO policy. Centrally storing the metadata from logical data models eases the identification and comparison of potential enterprise objects; (4) quickly assess the impact of data or model changes across multiple tools, applications, and projects; (5) enable storing the metadata in a central location from logical data models, and accelerating the data model review process by automating the comparison of models to other models and to the standard data elements. As a result, data quality and compliance to standards is improved and information excellence is promoted; (6) provide mappings that show the connection between the logical data models and the physical databases to help business users understand the complete picture of the USPTO data environment--promotes data integration efforts; (7) centrally store the metadata in the Enterprise Data Model as well as project data models which allows rapid execution of generating user reports to identify compliance or discrepancies between the project model and the Enterprise model; (8) develop enterprise information assets applications to enable business users the specific information they require in a format that they need; (9) respond to the users of the Repository as quickly as possible and utilize the user feedback to further enhance the repository into an effective business tool; and (10) continually maintain backups and enhancements that make the repository a reliable business tool. Functionalities and capabilities of the enterprise information repository are extended to create the Application Clearinghouse to support high quality technical reviews and demonstrate alignment with the Federal Enterprise Architecture.

1.3.5.7 Records Management

a. Description

Records Management is an USPTO-wide activity that ensures compliance with the Federal Records Act of 1950, while assisting business areas to operate more efficiently through the use of optimum records management practices. Under this activity, effective controls, such as disposition instructions, are established for the maintenance and use of records used to conduct USPTO business. Standards and procedures are instituted to improve the management of records, to promote the maintenance and security of records, the preservation of long term and permanent records, and to facilitate records access. The USPTO Records Management program consists of records management and agency information collection activities. It ensures compliance with the Paperwork Reduction Act and offers support for related OMB directives under the E-government initiatives. Records Retention and Information Collection are two of the three items under the Federal Enterprise Architecture Business Reference Model, Support Delivery of Services. They are considered key to the Business Management of Information.



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An active, effective USPTO-wide Records Management program is mandated by law and dictated by common business sense. Such a program supports on-going operations and facilitates the re-engineering and optimization of USPTO business processes. A well-executed vital records program supports disaster recovery. Attention to electronic records management is crucial to successful IT planning and must go hand-in-hand with the development of AISs. A standardized manner of handling records across the agency contributes to efficient operations. The USPTO Records Schedule provides such standardization.

One of the primary activities performed by the Records Management staff is to ensure that all USPTO records are scheduled through the National Archives and Records Administration (NARA). The published schedule provides the instructions for the disposition of the records, which may include permanent retention, deletion, updating, or disposal. This schedule is available not only in hard copy but also on the USPTO's Intranet through the OCIO home page. The USPTO Records Management staff maintains a close liaison with NARA. In 2003 the USPTO entered into a Memorandum of Understanding with NARA to pilot a new "big bucket" scheduling process that targets mission-critical records in each business area, when the long-standing NARA-defined approval process for scheduling records became a barrier to meeting our business goals. The USPTO entered into an agreement that takes advantage of NARA's targeted assistance program and, in addition, offered NARA assistance in their development of new business methods for scheduling all federal records. This cooperative initiative with NARA revamps the way all federal agencies schedule and manage records. The USPTO is expected to save time in managing its records and obtain a more stable, media-neutral set of records dispositions, to support new initiatives under the USPTO's 21st Century Strategic Plan.

Other services provided by the Records Management staff include assisting USPTO offices to organize their records for maximum operational efficiency, coordination and tracking of records stored off-site, training records coordinators in all USPTO business areas, and facilitating heightened awareness by management of the value of proper records management procedures.

A major activity in the realm of records management focuses attention on the management of electronic records. USPTO-wide electronic records management issues were identified in 1999. These must be resolved over the next several years for the USPTO to successfully implement an electronic workplace. The aspect of the program is described in section 5.6.2.1. Attention to vital records is also a key activity. Considerable progress has been made in this area with the completion of a vital records directive in mid-1999.

The information collection program operates to ensure the implementation of the Paperwork Reduction Act (PRA) of 1995. It is a critical undertaking within the USPTO Records Management program. It requires continuation of the USPTO's federally



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mandated information collection program. Under the PRA, federal agencies are required to review their public information activities to ensure that no unnecessary burden is placed on the public to respond to these collections. Wherever possible, federal agencies are required to reduce the burden to the public of responding to these collections, whether that information collection is voluntary or mandatory. Reducing burden can take many forms – from revising or eliminating current rules, establishing new rules, streamlining agency practices, and revising forms. Electronic commerce and the Internet are also changing the way that information is collected and disseminated. The PRA and other federal-mandated acts stipulate that federal agencies investigate electronic filing and electronic dissemination of information as a means to reduce burden.

Reports on agency progress towards full compliance with the GPEA (allowance for electronic transactions with the public) focus heavily on the agency's compliance and activities under the PRA. The GPEA requires government agencies, by October 2003, to provide business users with the optional use and acceptance of electronic documents, signatures and electronic records keeping, when practicable. In FY 2001, the OMB began requiring each agency to submit an updated plan on an annual basis. The information reported is essentially a summary of the agency's strategy and progress with GPEA compliance, the summary of the compliance of agency PRA collections, and an update of dissemination activities and agency transactions with other agencies. An USPTO-wide review of activities and programs is necessary to collect and prepare this report. In FY 2004, the GPEA reporting will be incorporated into a new annual report required under the E-Government Act of 2002. That act requires agencies to develop "citizen and productivity-related performance measures for use of E-Government and IT in meeting agency objectives, strategic goals, and statutory mandates."

Under the Records Management program, various information collections from USPTO program offices are validated to be in compliance with the PRA. The Records Management staff works with the program offices to ensure that new information collections are in compliance with the PRA. The information collection packages are prepared and submitted to OMB for approval. The USPTO Records Management staff maintains a close liaison with OMB. The Records Management staff prepares an annual Information Collection Budget report, the results of which OMB sends to Congress each year. This report provides the agency's budget associated with its information collection to the OMB. The Records Management staff also provides PRA support in certain instances to the rulemaking, Freedom of Information Act (FOIA) request, and Privacy Act activities of the Office of General Counsel. In FY2004, it is expected that OMB will pilot a new ROCIIS II software program that will automate portions of the agency's PRA submissions to OMB.

b. Commitments and Benefits

The USPTO-wide Records Management program supports the macro policy performance goal of helping to protect, promote, and expand intellectual property rights systems. It



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accomplishes this by protecting and handling efficiently a very critical asset—the records that contain our data, both in paper and electronic form. As the agency assigns official records status to electronic records, records existing in AISs must be treated as such. The implementation of the new General Records Schedule 24 will continue in FY2004 as will an effort to heighten awareness of appropriate records management of system software, Lifecycle Management documentation, inputs, outputs, and backups. The NARA-approved disposition provides the USPTO with the legal right to retain, update, delete, or destroy records. This is a Corporate Support commitment employing the strategy of effectively managing resources as well as leveraging information technology. The benefits of the Records Management program are described below:

- The program improves access to important records. Studies on records management indicate that executives waste almost six weeks per year trying to find items that have been misplaced, misfiled, or mislabeled. They spend about eleven percent of their time looking for items they or their assistants cannot find. It is estimated that a single misfile can cost \$150 in lost personnel time. Important functional documents are easily saved and retrieved with standard records management procedures in place, the driving goals of the USPTO's records management program. This functionality improves efficiency of business operations;
- Improved record keeping and electronic record keeping will lend support to an efficient Agency relocation to the new Carlisle site;
- Proper and current records dispositions support the USPTO 21st Century Strategic Plan initiatives. They will assure electronic initiatives move forward where electronic record disposition is of concern;
- The program identifies and provides direction on methods to protect the USPTO's vital records, which include those records that are required to continue operations after a disaster or that establish the financial or legal position or the rights of the USPTO, its employees or intellectual property stakeholders;
- Proper monitoring and tracking of information collection activities provides source data for studies, reports and reviews associated with recent presidential management agenda items and e-government initiatives;
- The program identifies confidential records and outlines acceptable practices to protect the information in these records, which heightens the employees' awareness of the confidential nature of the records and establishes a framework for protecting the words of the intellectual property stakeholders;
- Methodically retiring records offsite and destroying records in compliance with a schedule reduces space and furniture requirements, resulting in considerable



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savings to the USPTO and improving the work environment and increasing staff efficiency;

- The program ensures that existing information collections from program offices are renewed before they expire. Information collections associated with various AISs are monitored closely to determine if they will require OMB approval under the PRA;
- The program supports the agency to determine the agency's budget for its information collections. The significant increases and decreases in the public burden and the causes for them are described in the annual Information Collection Budget (ICB) report. The ICB report covers budget data resulting from information collection activity in the current fiscal year and an estimate for the next fiscal year;
- The program assists the Office of General Counsel in reviewing, in certain instances, the USPTO rulemaking packages, FOIA requests and Privacy Act activities, ensuring all of the information requirements are covered and that any changes to existing rules that affect the information requirements are reviewed and submitted to OMB for approval; and
- As information collections become available in a web-based format they are monitored for compliance with the PRA and other federal regulations.

1.3.5.8 Records Management Tracking System (RMTS)

a. Description

The Record Management Tracking System (RMTS) is an integral part of the USPTO records accessioning process (removal of inactive records from the USPTO) in support of Federal law and regulations. The system was implemented to address all processing activities performed on all accessions (or boxed series) of inactive records to NARA Federal Records Center (FRC). The RMTS is available to all USPTO business areas. This system supports the agency functions to comply with the Federal Records Act of 1950, while assisting business areas to operate more efficiently through the use of optimum records management practices. Tracking records allows for the disposal of records that would otherwise cost the agency unnecessary rent on prime office space and that would unnecessarily complicate searches for information.

b. Commitments and Benefits

The RMTS fulfills the commitments to the customers and staff by enabling them to manage the retention and destruction activities of USPTO records in a systematic approach. Support is provided to the USPTO Records Officer and program offices to



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track USPTO records. Records Coordinators are provided with a tool for management of records stored off-site. This automatic tracking system can manage storage and retrieval of agency's accessioned records. The benefits of the RMTS are primarily legal compliance and cost savings. First, the legal and financial rights of the agency are protected in compliance with 44 U.S.C. 31 and 36 CFR 1220-1236 and 36 CFR 1228. Second, USPTO operating costs can be reduced as agency access to vital records improve in accordance with 36 CFR 1236, OMB Circular A-130. Third, RMTS serves as a knowledge management tool for business areas. Lastly, RMTS effectively supports agency Freedom of Information Act activities.

1.3.6 Customer Support Services

The primary focus of the Office of Customer Support Services staff is to “keep the trains running.” That is, the staff has the responsibility to provide desktop hardware/software support services; manage desktop configurations; create and distribute information such as user guides, policies and procedures, notices or announcements, and newsletters; and provide Help Desk support, to both internal and external customers. The in-house staff is augmented by contractors to provide the full range of services required across the various hardware and software platforms in use.

The staff has two objectives. The first objective is to improve the services provided so that customers have timely, reliable, innovative, and cost-effective access to USPTO information technology when and where they need it. The second objective is to reduce costs so that the increasing number of customer IT requirements may be met. Achievement of these objectives, as evaluated through performance measurements, enables the staff to better meet and to exceed customer commitments and established service level agreements.

1.3.6.1 Customer Information

a. Description

The Customer Information Services Division (CISD) develops user and service guides to assist the customer with the use of new products, services, procedures, and policies. In addition, CISD publishes a quarterly newsletter to keep customers apprised of upcoming IT activities, share successes, provide helpful hints, and reiterate processes when beneficial. CISD also creates and distributes announcements, which are posted on the Intranet, as well as provides the IT Support Announcements via the daily “What's New” internal e-mail message to all USPTO employees.

The goal of CISD is to provide greater and more effective customer access to information, in using USPTO IT resources and services, and related policies and procedures. The Division develops informational products, consolidates and revises existing products to maintain standards of consistency, and updates products to reflect IT



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infrastructure changes. Recent efforts include the quarterly publication of *CIO News*, publication of office automation user guides and service guides such as *USPTO Internet Access Guide*, *USPTO E-Mail User's Guide*, *USPTO Windows NT User's Guide*, and *Ordering Computer Equipment at the USPTO*, the development and maintenance of OCIO related Intranet web sites, and the development and distribution of other IT related documents.

b. Commitments and Benefits

Information Services is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Information Services enables USPTO to maintain current business production, improve and enhance current business and IT infrastructure, and enhance and improve the tailored lifecycle management process.

In addition to meeting these customer commitments, Information Services provides benefits to customers and staff alike as described below:

- **Increased Customer Satisfaction**: A critical component of IT satisfaction is the level of understanding and expertise made possible through communications with the customer. Higher levels of understanding and expertise often mean that customers can derive greater benefit, in the form of enhanced productivity and ease of use, from their IT tools;
- **Efficient Customer Communication**: Keep USPTO customers informed of changing and evolving IT is critical to the successful use of the tools and resources provided to the customer. Publications such as *CIO News*, and office automation user guides and service guides provide the instructional and procedural information that customers need to effectively utilize IT tools and resources. Additionally, through these publications, USPTO business needs for standards, policy, and guidelines are conveyed; and
- **Section 508 Compliance**: Communicate USPTO efforts in digital format in accordance with Section 508 requirements, and develop supporting 508 documents.

1.3.6.2 Desktop Field Support

a. Description

The Desktop Services Division is responsible for resolving problems, moving, deploying, and surplus desktop hardware. The staff strives to meet customer expectations for courteous, prompt, and expert service. Demands on the Desktop Services staff have risen steadily with the increasing dependency upon IT and the growing complexity of the



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technology. The impact of Desktop Services on customer satisfaction with IT is enormous.

The Desktop Services staff strives to repair or replace failed hardware within 4 hours of notification and to respond to group printer problems within 1 hour of notification. The Desktop Services staff is improving hardware deployment services by tightening the monitoring of hardware inventories and modifying deployment procedures.

b. Commitments and Benefits

Desktop Services is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Desktop Support provides benefits to customers and staff alike through the following services:

- Providing prompt resolution of desktop hardware related problems; and
- Ensuring timely and successful completion of deployment requests.

1.3.6.3 Information Technology Auto Discovery System (ITADS)

a. Description

The Information Technology Auto Discovery System (ITADS) will automatically discover the software, hardware, configuration file, and network devices information from all major platforms. The ITADS uses Commercial-Off-The-Shelf (COTS) product for automating the discovery of hardware, software, and configuration files of each NT workstation, NT server and Unix server in the USPTO enterprise. This information collected by ITADS is stored in a central Oracle database.

b. Commitments and Benefits

The ITADS enables managers to plan enterprise upgrades, rebuild the enterprise after a disaster (at the management level), optimize end-user productivity, reduce total cost of ownership by enforcing desktop standards, improve support services, and generate unlimited ad hoc reports for review as well as tracking hardware and software changes and needs. ITADS also provides the following benefits for the enterprise asset tracking system:

- Complete enterprise-level asset tracking system that can discover, store, and report detailed asset information for USPTO.
- Automatic discovery of the hardware, software, configuration files on independent platforms (Window NT/2000 server, HP-UX, SUN SPARC Solaris).
- Easy-to-use graphical interface for data analysis and retrieval, such as Asset Viewer, including the Analyst, Report Clerk, Auditor and Desktop Guru.



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- Provide a tool for the administrator to create user-defined tables, delete existing tables, and manage assets.
- Identify all currently installed hardware and software throughout the enterprise, plotting historical trends, and projecting future asset changes in order to make beneficial decisions about hardware and software assets.
- Ensure that the enterprise has the hardware and software resources necessary to maintain optimal productivity.
- Report system assets from a network management perspective, with the goal of proper allocation and optimal usage of resource.
- Monitor installed software to gauge the number of necessary licenses.
- Automatic discovery of the network devices that respond to SNMP commands, such as bridge, router, hub, and switch.

1.3.6.4 Electronic Business Support for Public Customers

a. Description

Technical assistance is provided to public customers that use online USPTO systems for Patent/Trademark applications, status inquiries, payment, and other functions. This project is consistent with USPTO's goal of increasing online filing. Inquiries from public customers regarding USPTO electronic business systems are resolved to ensure that the electronic transactions are reliable.

b. Commitments and Benefits

The use of electronic business systems enables public customers to easily monitor the progress of their online filings. The benefits of this type of support is that increasing number of customers will file online, and customer confidence will rise as they become more accustomed to online filing versus paper filing. In addition, help desk support will ensure that the inquiries are being adequately addressed.

1.3.6.5 Help Desk and Desktop Software Services

a. Description

The Help Desk and Desktop Software Services is the primary point of contact for IT problems and service requests. The Help Desk and Desktop Software Services receive and record the problems and service requests. The Help Desk and Desktop Software Services trouble-shoot and either resolves or reassigns problems. The Help Desk and Desktop Software Services provide support, such as desktop software installation and reassign others. The staff strives to meet customer expectations for courteous, prompt, and expert service.



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Demands on the Help Desk staff have risen steadily with the increasing dependency upon IT and the growing complexity of the technology. The impact of Help Desk and Desktop Software Services on customer satisfaction with IT is enormous. The Help Desk and Desktop Software staff must use automated resources to improve productivity and to meet customer goals for availability and quality support services. The Help Desk and Desktop Software Services will gather detailed information on the handling of customer's calls, problems, and service requests. Help Desk and Desktop Software Services staff analyzes data provided by the Automatic Call Distribution system to report call volumes and to report the average answer speed of incoming calls.

The Help Desk and Desktop Software Services are implementing changes to respond to customer calls more quickly, reduce the number of customer calls that are either abandoned or sent to voice mail, return voice mail calls more quickly, increase the number and types of problems that are immediately resolved by the Help Desk staff, and improve the handling of those problems and service requests which are not immediately resolved. To complement the Help Desk and Desktop Software Services, an Advance Problem Resolution team handles the most difficult problems and follow-ups on unresolved problems and service requests.

In addition, the Help Desk and Desktop Software Services assist in the implementation of Knowledge Paks (KPAKS) to quickly and effectively identify and resolve customer reported problems. Knowledge Paks are on-line repositories of AIS and product-specific trouble-shooting information, which will enable the Help Desk and Desktop Software Services to immediately resolve many of the problems that they must now reassign to others. Knowledge Paks were developed for those automated information systems with the largest customer bases. The KPAKS are offshoots of the Operational Support Plans and generally serve as the "live" document as new problems/solutions are identified throughout the life of an AIS. These KPAKS are searchable based on error messages, problem descriptions, system interfaces, points of contact, and system overviews. In the near future, Knowledge Paks will be developed and deployed at the same time that each new automated information system is deployed, regardless of the size of the customer base.

The Help Desk and Desktop Software Services has expanded the Customer Quality Check process, which is used to gather customer feedback on the handling of problems. This process has expanded to include customer feedback on service requests, as well as, problem calls.

b. Commitments and Benefits

The Help Desk and Desktop Software Services is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. The Help Desk and Desktop Software Services provide benefits to customers and staff alike as described below:



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- Providing a single point of contact for requesting IT related services and for reporting IT related problems;
- Improve customer service by quickly isolating and resolving complex/difficult IT problems;
- Improve system functionality and customer acceptance by identifying the problem and bringing the problems to the attention of the develops immediately;
- Providing prompt completion of desktop software related service requests and resolution of desktop software related problem reports; and
- Following procedures in the Operational Support Plans to ensure that problems and service requests are handled properly.

1.3.6.6 Web Services

a. Description

The USPTO uses IT to disseminate information to the public (Internet) and to USPTO employees (Intranet). This information includes patents, trademarks, technical standards, and on-line dialogue and discussion groups. The USPTO Intranet provides browser access to internal web servers and access to the Internet for e-mail and database searches. Internet access at the examiner desktop has been in production for five years. Daily usage continually grows as the new availability of data to enhance searching is employed. The use of Internet electronic mail, newsgroups, chat capability, and web services has significantly improved the USPTO's ability to provide current information to help employees do their job. Additionally, more and more AISs are being targeted for the browser. This makes the support of the browser environment more critical in the coming years to perform the necessary support functions as described below:

- Support the development, deployment and maintenance of web-based services;
- Provide Web administration services on primary USPTO Internet and Intranet servers;
- Evaluate and provide recommendations to the System Architect on the feasibility of commercially available web tools;
- Provide services such as web page design, troubleshooting, recovery, and maintenance strategies for COTS applications designed to operate within the Web;



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- Provides support services to Web enabled AIS projects;
- Establish and maintain a survey on the USPTO Internet website for public customers to provide feedback on their level of satisfaction;
- Maintain web content management server (Interwoven) and client licenses to enable version control across the entire website and allow for content rollbacks.
- Gathers statistical data on the web site usage; and
- Provide support for the web client.

New technology will continue to evolve and enable users to have faster access to more timely data, which will trigger demands to increase the use of IT to help, manage programs and provide new services. More significantly, the impact of Web Services on customer IT satisfaction is significant. The Web Services Division (WSD) provides expert assistance to expand customer access to databases in a newly evolving and continuously changing environment.

b. Commitments and Benefits

Web Services is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. This activity enables the USPTO to maintain current business production, and improve and enhance current business and IT infrastructure. In addition to meeting these customer commitments, WSD provides the following benefits to customers and staff alike:

- The quality, accuracy, and efficiency of USPTO employee efforts often depend on their ability to access information in a timely manner and in a useful format. WSD provides cost-effective access to information;
- Intranet applications and services provide dynamic access to legacy data through standard web interfaces; and
- As the Intranet continues to develop, it has the potential to become the resource for training, reference material, and electronic services.

1.3.7 Common Services

The primary focus of Common Services is to support operation and maintenance of computer facilities, hardware, software, and telecommunications capabilities deployed in support of the USPTO business processes. The in-house systems and networks provide



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the full range of services required across the various hardware and software platforms in use. The services include Enterprise Management System (EMS), Enterprise Wide Login, Fax/Modem system, Integrated Tape Backup System, Operating System upgrades, and PKI.

1.3.7.1 Enterprise Management System

a. Description

Since 1994, the USPTO has focused on replacing the heterogeneous collection of incompatible hardware and software systems with a standards-based open system IT infrastructure through EMS. New systems and capabilities have been deployed based on distributed client-server architecture with heavy reliance on PTONet to deliver needed services. While the USPTO's distributed computing environment provides many business related benefits, the Operations staff is faced with many new challenges in managing it. The USPTO's IT infrastructure will ultimately consist of two key hardware platforms and their associated operating systems: HP/UX and NT, and a single database management system: Oracle. Currently, USPTO has over 112 HP/UX application and database servers. In addition to the Unix-based servers, the USPTO has approximately 185 NT application, office automation, and workflow servers dedicated to providing office automation and custom application services. USPTO has a continuing need to deploy additional servers as applications, users, and data volumes increase.

One of the IT management objectives is to automate computer center and network operations. In the past, when all processing was mainframe-centric, there was IT processes and products to manage the environment. These products and services cannot be migrated to the new open architecture. To successfully manage its IT infrastructure and support both its ongoing and new business processes, the USPTO is adopting the concept of an enterprise view of system and network management. Software tools to support enterprise services are commercially available. These products, once integrated, are collectively called an enterprise management system. Enterprise management systems provide for fully automated, proactive system management and service level management of application and data base servers.

The EMS consists of a suite of products and services that together provide an automated and reliable solution for managing the development and operation of selected components and services of the USPTO IT infrastructure. The IT infrastructure focuses on incorporating and supporting the following activities and key service areas: (1) central control; (2) network management; (3) server management; (4) database management; (5) Enterprise Asset Management System (EAMS) interface; performance management; and (6) problem management. EMS will also help ensure the availability, fault management, and automated operation of these parts of the infrastructure. The EMS will correlate, refine, synthesize, and report availability and fault data generated by the selected components of the USPTO IT infrastructure such as: servers, workstations, storage



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devices, networks, and communication devices. EMS will perform or will have interfaces to such functions as configuration change management, application change installation and recovery, help desk management, software distribution, and system and network management.

EMS will complement the existing Network Analysis product suite and will provide the data from these components; correlate and interpret that data; and provide a filter, translation, and priority for system event messages to avoid potential capacity problems and bring potential performance problems to light.

b. Commitments and Benefits

The EMS project is an IT infrastructure project that supports all business areas as well as IT infrastructure projects. The EMS enables the USPTO to maintain current business production, and improve and enhance current business and IT infrastructure. Key benefits include:

- Manage selected central and distributed IT components more effectively;
- Enable Network Operations To Prevent Or Respond To Problems;
- Enables a high level of monitoring availability in support of E-Gov;
- Enables standardized monitoring procedures and practices;
- Eliminates the need for duplicate systems which reduces costs and provides more comprehensive monitoring capabilities;
- Enables a comprehensive view of the USPTO enterprise and the relationships between the applications and network devices;
- Enables proactive response to potential problems prior to a critical situation to avoid impacting the USPTO user community;
- Improve maintenance and operation of high priority aspects of the heterogeneous complement of equipment and software;
- Enable infrastructure operations to prevent or respond to problems;
- Increase administrative productivity by automating many time consuming administrative routines;



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- Improve the IT planning process by ensuring that selected performance measures are tracked and reported at regular intervals;
- Enable AIS Operations to prevent or respond to problems;
- Remain flexible enough to change as the business grows or re-directs itself; and
- Link business information to the IT resources that support the mission-critical applications.

1.3.7.2 Enterprise Wide Login

a. Description

Enterprise Wide Login automatically authenticates and encrypts communications between the users' workstation and the application server. PACR, Examiner Automated Search Tool (EAST), Web-based Examiner Search Tool (WEST), and approximately 20 additional applications currently use Enterprise Wide Login. The SSO services are used by the Patent Corps, the Office of Trademarks, and sections of OHR and OCIO. SSO and Account Management over time need to be deployed throughout PTO provide secured communications across PTONet and to simplify account management. Automated account management is a very important to PTO security process. USPTO currently has 8000 SSO licenses. SSO and centralized account management over time need to be deployed throughout USPTO to provide secured communications across PTONet and to simplify account management. SSO can continue to support automated login and encryption services to legacy systems and any new systems that cannot use USPTO's portal technology for automated authentication. SSO will support and integrate with USPTO's Enterprise Directory Services project. The next release of eTrust SSO, version 7.0, will allow SSO user data to be stored in Active Directory, thus supporting the goal of a single database for user identifications, passwords, and other authentication and access control information. In FY 2004 and FY 2005 OTAES will migrate from Computer Associate's SSO to the new architecture. In FY 2006 USPTO plans to change the SSO platform from HP-UX to Intel/Microsoft. This change will result in significant server maintenance costs.

b. Commitments and Benefits

The Enterprise Wide Login project meets commitments to customer and staff by ensuring a secured, encrypted connectivity to AISs, single account usage to access all application and PTO network services, and centralized account management that enables immediate termination of account services and simplifies account resets. Also, the benefit to this activity is that SSO and Account Management will provide a single user ID and centralized password management. When disabling an account, it will be done centrally, and Account Management will disable all associated accounts to prevent a security risk



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that occurs when disabling/terminating services to a user because there is no way to know all of the systems/services where a user may have an account. This process focuses on NT, Firewall, UNIX, SSO, Oracle, and back-end AIS access via SSO.

1.3.7.3 FAX/Modem System/Capability

a. Description

USPTO FAX is an official means for electronically applying for patents and trademarks. The USPTO FAX provides a common, networked FAX capability that allows the USPTO user community to send and receive faxes from their office workstations. The system processes official faxes for all business units as well as business related faxes to and from personal workstations. This system is available to all USPTO employees and contractors based on their needs. For each FAX call received by the official FAX numbers, a confirmation receipt is generated automatically and sent to the caller.

b. Commitments and Benefits

This activity meets the commitment to the customer and staffs by offering electronic fax send/receive capabilities from the local workstation without the use of a local modem. There are full reporting capabilities for each fax processed (e.g. date time stamp, number dialed, number of pages, etc.), including automatically generated official return receipt of fax, search, and retrieval capabilities of processed faxes, and export feature to other AISs. In addition, the benefits of this system to customers and staff are as follows:

- Increase in efficiency of fax process while reducing security risk on PTONet;
- Better management of all fax correspondences and system performance;
- Reduction in the number of misrouted faxes; and
- Search and retrieval and electronic archiving capabilities to other AISs.

1.3.7.4 Enterprise Tape Backup System

a. Description

The Enterprise Tape Backup System (ETBS) delivers USPTO wide backup system for standardized enterprise backup and management of critical data for disaster recovery and archive with vaulting capability to place backup offsite. At the conclusion of Phase 3 in early FY 2003, every server in each of the domains have backup & restore capabilities. Some specialty servers (e.g. Firewalls) will be backed up locally as necessary. Phase 4 enhancements will focus on getting concurrent (e.g. Oracle Hot Backup) and synchronous backups across multiple servers in support of business applications. Future



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activities include additional functionalities and technology refresh, i.e., the current tape media and Drive technology is drawing to an end, and needs to be refreshed to keep pace with the growing data storage, performance, and E-Gov requirements and needs. USPTO will also need to improve all backup procedures and automate manual procedures related to backup and offsite data storage.

b. Commitments and Benefits

The ETBS enables USPTO to synchronize backup across multiple servers, including hot backup capability (back up run while business applications are still running). Standard procedures are being established for timely and reliable backup of critical data that will further improve reliability and performance of backups. This activity will also provide the processes to improve data recovery procedures. In addition these commitments, the benefits are as follows:

- Improve business continuance capabilities in the event of disasters;
- Reduce operations and maintenance cost of tape backups;
- Support server recovery in the event of a server failure;
- Support data restoration in the event of data corruption, hardware failure, or human error;
- Lower the likelihood and amount of potential data loss;
- Faster data recovery translates to less down time; and
- Control operations and maintenance costs (e.g. lowering cost per terabyte.).

1.3.7.5 Network Attached Storage (NAS)

a. Description

The NAS System provides a common, network-attached storage solution, accessible to selected clients and servers (a.k.a., NAS Clients), on either the USPTO local area network (PTOnet) or the Emerging Technology Center (ETC) Lab network (LABnet). Files on the NAS System are directly accessible, and shared, by UNIX and Windows servers and clients across the selected USPTO enterprise network. The NAS Clients access files on the NAS using their native file system, without requiring an intermediate server through the Ethernet LAN.



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The NAS System provides user interfaces that permit the USPTO operational staff to easily set up and manage the shared storage. The storage space allocated to a NAS Client can be backed up, while read and write operations continue, without significantly impacting performance for any NAS Client.

b. Commitments and Benefits

The NAS meets the commitments to the USPTO staff and customers by providing lower cost storage and lower maintenance costs. The NAS separates storage resources from network and application servers, in order to simplify storage management and improve the reliability, performance and efficiency of the network. The benefit of this storage system is lower average performance and decrease in the risk of network contention.

1.3.7.6 Operating System Upgrades/Migration

a. Description

The Operating System Upgrades/Migration effort includes the following activities, mostly related to desktops and servers:

Linux Server OS Migration: Linux has been gaining industry momentum over the past few years and is expected to become an important part of IT environment in most enterprises. USPTO currently has few Linux servers in operation and more are planned for use. This project is to plan, engineer, develop, test, and migrate all USPTO COTS and AIS applications on Linux Server operating system;

Microsoft Client OS Migration: This activity is to engineer, develop, test, and deploy all USPTO COTS and AIS applications on client operating systems. The current USPTO standard client OS is Microsoft Windows NT WS 4.0, which will not be supported by the manufacturer after June 2003. USPTO will be migrating to MS Windows XP Professional starting in FY 2003 and the migration will be completed in Q1 or Q2 of FY 2004. The next client OS expected from Microsoft is Longhorn, which is planned for FY 2006 release;

Microsoft Server OS Migration: This project is to engineer, develop, test, and deploy all USPTO COTS and AIS applications on Microsoft Server operating system. Currently, USPTO is migrating from Microsoft Windows NT Server 4.0 to Windows 2000 server and this migration is expected to be finished in FY 2004. The manufacturer will be releasing Windows 2003 server in April 2003, which offers enhanced security and functionality based on its .NET architecture that supports 64 bit addressing with improved AD functions; and



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Unix Server OS Migration: USPTO currently has multiple versions of HP-UX, Sun Solaris, and new IBM-AIX 5.2. This project is to plan, engineer, develop, test, and migrate all USPTO COTS and AIS applications on UNIX Server operating system.

b. Commitments and Benefits

The plan to upgrade and migrate existing operating systems will achieve the following expected results for the customer and the staff:

- Ensures compatibility with USPTO infrastructure;
- Allows enhanced functionality and user experience;
- Ensures reliability of user applications;
- Improves operating system functionality and user experience customized for USPTO environment;
- Insures compatibility with USPTO supported COTS and AISs;
- Enhanced operating system and application security/reliability;
- Greater interoperability and manageability compatible with USPTO Enterprise Architecture;
- Allows PCs basic functionality to be able to operate AIS/COTS application;
- Ensures software functionality, compatibility, and continued vendor support;
- Upgrades capabilities that will increase speed and reliability of PCs and peripherals; and
- Enhances operating system and application security.

1.3.7.7 Public Key Infrastructure (PKI)

a. Description

Entrust Public Key Infrastructure is an electronic security solution (encryption/decryption) to protect data from intruders during electronic business transactions. Entrust PKI provides authentication, confidentiality, access control, integrity and non-repudiation of data and business transactions during transit (email,



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electronic forms, electronic access) or in storage (data storage, database, backup) for international transactions (WIPO, TriNet/Trilateral, IFW).

The Trilateral Offices and WIPO are beginning to use Digital Certificates associated with PKI technology to enable electronic commerce among themselves and with their external customers. USPTO is presently issuing Digital Certificates for its PKI services that are used by the ePAVE client of the online IFW. In the same time period EPO has begun issuing Digital Certificates and Smart Cards for electronic filing with their online epoline system. The Offices have committed to work for interoperability among their PKI systems as use of this technology expands. In order to achieve interoperability it will be necessary to synchronize the PKI directory and CA servers of the offices to exchange Digital Certificate related information. The implementation of an effective IT Security Program fulfills the E-Gov project and the Human Capital Improvements within the President's Management Agenda by establishing a robust security infrastructure and a more skilled and knowledgeable workforce regarding IT Security.

In addition, the PKI initiative will help to integrate USPTO PKI with the Federal requirements, including Federal Bridge requirements, e-Authentication, and the Federal SmartCard Implementation Plan by using SmartCard as a container for PKI certificates. This activity is to primarily maintain the PKI infrastructure for approximately 25,000 deployed credentials for inventors, maintain the PKI licenses, and provide engineering support to AISs that require modification to PKI implementation.

b. Commitments and Benefits

The PKI meets the commitment to customers and stakeholders by providing PKI authentication and credentials to PTONet, Common Card, electronic and directory services. In addition to these commitments, the PKI provides a single means of authentication to increase user productivity, single credentials for accessing multiple systems, decrease in number of accounts and the ability to exploit accounts, secure electronic patent submissions, and secure authentication of USPTO employees to IT systems. In general, the PKI initiative ensures that electronic transactions of USPTO systems by external customers are performed in a secure electronic environment. The implementation of PKI also enables secure authentication of USPTO employees to IT systems to prevent the possibility of unauthorized access to critical systems. USPTO complies with international agreements that require secure electronic submission of patent applications.

1.3.8 IT Security Program

Confidence in the integrity and security of the USPTO's electronic information and the supporting IT infrastructure is essential for creating a trusted environment; in which, USPTO and its customers and business partners can conduct business electronically. The increased use of distributed automated information systems to store, process, and



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communicate sensitive data throughout the USPTO has added a new dimension of complexity to the traditional security concerns confronting managers and employees. The increasing reliance on networking technologies further complicates the AIS security problem. The significant benefits to be gained from using information technology must be accompanied by the implementation of an AIS Security program that enables the productive use of IT, while reducing the associated security risks to an acceptable level.

The objectives of the USPTO IT Security Program are to:

- Establish and enforce controls for the protection of personal, proprietary, and other types of sensitive data against disclosure, modification, or destruction as appropriate;
- Protect funds, supplies, and material from fraud, theft, misappropriation, or misuse;
- Maintain the continuity of USPTO operations by preventing the occurrence or minimizing the impact of security related events that interfere with normal data processing operations;
- Regularly assess the status and security of USPTO AIS and infrastructure, identify and correct vulnerabilities, and adjust policies and procedures to maintain an appropriate level of protection;
- Maintain the certification and accreditation of all USPTO AISs at a minimum of every three years, in conjunction with compliance testing and self-assessments of AISs. The certification and accreditation activities will meet the Federal Information System Management Act requirements;
- Provide IT security training to USPTO IT users, operators, and maintainers to promote AIS security awareness and accountability at all levels within the USPTO; and
- Identify, resolve, and report IT security incidents in a timely manner.

1.3.8.1 Centralized Audit Logging Solution (CALS)

a. Description

USPTO is implementing Centralized Audit Logging Solution that logs significant events for devices, operating systems and databases. This solution will consolidate events from existing data sources and be configurable to alert appropriately on suspicious log behavior. The CALS will log significant events for devices, operating systems and



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databases. This solution will consolidate events from existing data sources, logs significant events for devices, operating systems, and databases, and be configurable to alert appropriately on suspicious behavior. This initial capability will balance scope and cost, and be able to scale to enterprise level deployment at the discretion of executive sponsors.

b. Commitments and Benefits

The Centralized Audit Logging Solution is meeting the commitments to the staff and customers by serving as an assurance tool for USPTO. Audit services provide a chronological record of events in the audit logs. These logs support accountability by recording events. The audit log reveals how well the security mechanisms are working. If no auditing is being conducted, then effective security monitoring will not be satisfied, and thus confidentiality, integrity, and availability of data are at risk. The audit log is also potential evidence for legal or administrative actions if violations are identified. The benefit of this solution is that the overall security infrastructure of USPTO will be improved through the development of a concrete, production-ready system for collecting and logging of significant events for AISs. In addition, CALS can improve detection of security incidents and save money by reducing the number of alarm notifications.

1.3.8.2 Federal Bridge Cross Certification Authority (FBCA)

a. Description

The USPTO has achieved a milestone with the PKI/Smartcard efforts by initiating an application for participation within the Federal Bridge Certificate Authority (FBCA). The application process, if approved, will create a path of authenticated trust between USPTO and other Federal Bridge members including Department of Defense, Department of State, some state governments, and the Government of Canada. The application process should be completed by November 2004.

The Federal Bridge Certification Authority (FBCA) supports interoperability among Federal Agency PKI domains in a peer-to-peer fashion. The FBCA issues a certificate only to Agency Certification Authorities (CAs) specified by the owning Agency (called "Principal CAs"). The FBCA, or a CA that interoperates with the FBCA, may also issue certificates to individuals who operate the FBCA. The FBCA certificates issued to Agency Principal CAs act as a trust domain. The Federal PKI Policy Authority (FPKIPA) is the governing body over the FBCA.

b. Commitments and Benefits

The commitments are being met by applying to the FBCA and the benefits will be realized by enabling federal agency interoperability and partner cross certification. The USPTO internal Certificate Authority (CA), whether deployed as an "in-house" solution or contracted for as an outsourced service, will conform with and be accepted as



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an operating partner of the FBCA. The FBCA partnership will allow provide USPTO and its employees greater flexibility to interoperate with other Federal agencies that that are members of the FBCA. The participation means that members of the bridge will be able to trust transactions and communications from holders of USPTO digital credentials and in turn, that USPTO can trust users from other accredited bridge member agencies and companies. USPTO will cross-certify its PKI Certificate Authority (CA) service with the Federal Bridge Certification Authority (FBCA) and will maintain a Border Directory service that is linked to the FBCA Directory Infrastructure.

1.3.8.3 Security Certification and Accreditation

OMB Circular A-130 requires management officials to formally authorize the use of a system before it becomes operational. This authorization, also referred to as accreditation, denotes that the manager understands and accepts the responsibility for the risks associated with a system in production. In addition, OMB A-130 requires that agencies perform a formal management review of controls at least every three years.

The Office of Inspector General (OIG) from the DOC has identified a USPTO material weakness attributed to its IT Security Program. This assessment was reported in the FY 2002 PTO Government Information Security Reform Act (GISRA) report to OMB and is based in part on the absence of a certification and accreditation program for USPTO systems. Failure to remedy the defects in the USPTO security program will constitute federal government negligence in the protection of the private property entrusted to USPTO. The following actions have been taken to address the material weakness relating to certification and accreditation:

- **Certification and Accreditation of USPTO Automated Information Systems:** The USPTO has developed a program for the certification and accreditation of all USPTO operational systems for compliance with OMB Circular A-130. In addition, the USPTO is required to re-certify and reaccredit operational systems every 3 years;
- **Compliance Testing:** Compliance testing is conducted to provide evidence of compliance with the Federal Information Systems Management Act, OMB guidance, and GAO directives. The Department of Commerce, under the direction of OMB, GAO, and Congress, is instituting a program for compliance testing of major systems in each Department agency. The USPTO has developed a plan for compliance testing for USPTO systems; and
- **NIST Self-Assessment:** Self-assessments provide a method for DOC and other agency officials to determine the current status of USPTO information security programs and, where necessary, establish a target for improvement. This self-assessment guide utilizes a very lengthy questionnaire containing specific control objectives and techniques that will be tested and measured against each automated



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information system. The control objectives and techniques are abstracts from requirements found in statute, policy, and guidance on security.

b. Commitments and Benefits

The commitments are being met to the customer and staff through the following actions:

- Security Plans are updated;
- Risks assessments are conducted;
- Contingency Plans are updated;
- Security Tests and Evaluations are conducted;
- Certification/Accreditation documentation is developed for management approval;
- Common event repository is established;
- Structure information framework (schema) for event recording is developed;
- Solutions for residual vulnerabilities are identified and implemented;
- Each NIST question for IT Security self-assessment will be answered for each operational system; and
- A CIO auditor will conduct compliance testing (vulnerability/penetration) to ensure integrity of USPTO IT Security Program.

In addition, the following benefits of the certification and accreditation process includes:

- Compliance with Federal law including the Federal Information Systems Management Act;
- Resolution of the material weakness declared in FY 2002;
- Security controls that can handle significant changes to the system as well as rapidly changing threats;
- Risk Assessment to a system that is ongoing necessity to ensure that new threats and vulnerabilities are identified so appropriate security measures can be implemented;



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- Procedures that are documented to back up and recover a system in event of service interruption;
- Security controls, features, and procedures that are in place and working properly as required before a system is accredited;
- Verification of the accreditation process that has been completed for that system and identifies residual risks;
- No impact ability to analyze log files for root cause due to System failures or corruptions;
- Events from different systems that can be correlated for response to threats or in RCA;
- Log files can be trusted since they are not maintained by the corrupted server;
- Rapid resolution of security vulnerabilities that preclude IFW accreditation; and
- An IT Security Program that will be verified by a third party.

1.3.8.4 Secure Document Handling

a. Description

Patent Corps and Information Dissemination are seeking ways to ensure the confidentiality and integrity of patents data. For published patents, Information Dissemination is seeking to release electronic versions of official copies that are legally and provably "signed" by USPTO. Within the Patents Corps, examiners are seeking ways to leverage electronic versions of unpublished applications for remote or off-line work. Electronic versions increase the risk of disclosure and require security controls to prevent accidental or deliberate widespread distribution. This project prototypes the use of secure documents (e.g. Adobe PDF) and PKI credentials to sign, encrypt, and watermark PDF files. Once demonstrated, additional work is required to modify USPTO applications to produce the secure PDFs.

b. Commitments and Benefits

The ability to ensure secure document handling provides commitment and benefits to the staff and customers alike. Both USPTO personnel and customers will have IT systems that maintain the integrity and confidentiality of IT systems with the capability of electronically distributing signed, legal applications. Patent examiners will also have



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non-distributable access to confidential patent applications. More importantly, legal actions to certify disseminated public applications may be minimized as well as reducing the risk for deliberate or unintentional disclosure of unpublished patents by examiners.

1.3.8.5 Security Infrastructure Protection

a. Description

The USPTO local area network and the operational systems on the network are protected through the use of firewalls, intrusion detection system, public key infrastructure, virus-protection, and enterprise wide login system. In a March 2002 report, the OIG recommended that the USPTO procure, install, and maintain intrusion detection systems. The USPTO has developed a network intrusion detection system, and is in the process of developing a host-based intrusion detection system, which requires more funding. Firewall consolidation will support the upgrade of equipment necessary to support partitioned network zones including external access for partners and contractors. In addition, USPTO leveraged existing PKI licensing to establish an internal certificate authority in accordance with standards that enable interoperability with federal programs, including the Federal Bridge and e-Authentication. Also, by implementing SmartCards as the container for PKI certificates, USPTO is consistent with the Federal SmartCard Implementation Plan and the GSA SmartCard program. USPTO is seeking to provide logical and physical access control through a single employee "ID card". Leveraging the physical cards planned as part of the Alexandria Headquarters relocation, this activity will enable the same cards as strong authentication to systems.

Security Infrastructure Protection includes vulnerability testing. The USPTO has been conducting unannounced tests to "break into" an operational USPTO system to reveal vulnerabilities that need to be addressed, and if possible, eliminated. Such testing provides fewer and shorter disruptions in IT operations.

The USPTO will continue to develop and refine enterprise security services. The enterprise services are a vital piece in moving the patents and trademark business process to a system that guarantees the confidentiality, availability, and integrity of the process and the Federal records produced. As USPTO continues to expand its use of the Internet to conduct business with its business partners and customers, greater emphasis will be placed on enterprise systems and services that provide for confidentiality and integrity of the data.

b. Commitments and Benefits

The Security Infrastructure Protection activity supports the commitments made to the customers and staff is as follows:

- Reduce number of different firewall solutions;



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- Establish "protection zones" that off-load AIS security requirements onto infrastructure;
- Enable a single means of authentication to increase user productivity and level of user/customer satisfaction;
- Identify modification to system files on critical servers (e.g. network perimeter, finance);
- Reduce the number of accounts and the ability to exploit accounts;
- Enable USPTO credentials to be recognized at other federal agencies;
- Demonstrate secure system lifecycle in compliance with federal and legislative requirements;
- Greater utilization of AIS servers with decreased antivirus load;
- Protect PTONet communications;
- Identify and test standard system images for USPTO servers and workstations unannounced, independent tests of IT security;
- Develop firewalls support ETC lab protection and AIS test environment;
- Reduce risk of exploitation for mission critical systems;
- Provide virus protection by filtering questionable email; and
- Provide virus protection by filtering covert attacks from workstations.

The benefit to the USPTO is that there is less vulnerability of USPTO systems and data to malicious attacks. This protection will ensure fewer and shorter disruptions in IT operations. There is also a common architecture that will reduce diversity of assets, accelerates development, and lowers TCO. Since security requirements are "built into" infrastructure, accreditation and transparency is facilitated to users. System recovery is shortened and increases the reliability of security patches. The risk of exploiting critical systems is also minimized. A security "zone" is established that will relieve AIS burden to protect information exchange. Systems are protected from embedded threats and prevented from propagation in terms of virus protection. More importantly, the implementation of the Security Infrastructure Protection project will help USPTO comply



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with the DOC, OMB, and NIST guidance in addition to the USPTO 21st Century Strategic Implementation Plan.

1.3.8.6 Security Operations and Maintenance

Activities to continuously enhance security are essential to consistently provide the reliability, maintainability, and availability of network resources and to achieve the level of operational integrity required to support the needs and expectations of the USPTO user community. Also important is the ability to provide the necessary level of security and enable the rapid infusion of new technology to meet the constantly growing demands of the USPTO workforce. In particular, efficient patch maintenance requires efficient notification, approval, testing, and deployment. Also, effective account management including authorization and termination procedures is required to assure USPTO systems.

b. Commitments and Benefits

There are three key components of the Security Operations and Maintenance:

- **Intrusion Detection System**: Network Intrusion Detection analyzes traffic within and exchanged with PTONet. Attack and scan signatures are detected weekly enabling USPTO to block the offender from further attempts. This system has been deployed and is a leading factor regarding the low risk ratings for our perimeter system in penetration studies;
- **Physical Access Control**: This activity provides video surveillance of controlled areas and guard services for the data center. Access cards and other access tokens are used until replaced by common SmartCards; and
- **Security Operations**: This project provides the staff and tools to respond to vulnerability notices and detected incidents including system log inspection, and patch updates. Furthermore, standard security services are practiced, including account management (PTONet, AIS, PKI, etc.), risk assessments, investigations, and contingency trials.

In addition to the commitments to the customer and the staff, the benefits are as follows:

- Detect and block internal or external network attacks against USPTO assets are detected and blocked;
- Detect and report Change or corruption of critical server system files are identified and reported;
- Availability and integrity of business systems is maintained;



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- Critical servers housed in data center are protected;
- Access control for controlled areas is established;
- Strong authentication for remote access to PTO systems is in place;
- Systems are available and maintained at reduced risk;
- Threats are mitigated and reported in accordance with Department guidelines;
- Threats are identified and mitigated in accordance with HR and Union processes;
- System changes are inspected for security vulnerabilities;
- Procedures and technician expertise for recovery are improved and verified; and
- User system access is supported via account access controls. System vulnerabilities are reduced by elimination of unneeded accounts.

1.3.8.7 Security Planning and Compliance

a. Description

AIS systems require security architecture definition and engineering expertise across a variety of technologies (firewall, authentication, encryption, anti-virus, etc.). Security architecture definition and engineering enable security solutions that avoid unnecessary exposures and integrate with enterprise architecture at a minimum schedule. In addition, system usage reporting is not available for security investigations or protected from corruption. Auditing enables systems, software, and AISs to report significant events. An auditing solution captures this data in a searchable, protected repository. Auditing will enable enhanced troubleshooting, impact assessment, investigations, and legal admissibility with superior quality and responsiveness. The IG Audits and independent inspections have highlighted that USPTO does not have security policy definition with enterprise authority. Security policy communicates the business priority of security and authorizes the methods of enforcement. Without documented policy, USPTO employees have no enforceable obligation to comply with guidance. This project will ensure that policies are integrated with guidance from other federal sources and USPTO business areas by defining, coordinating, and communicating the security policy to the user community. These efforts will be heightened in FY 2004.

b. Commitments and Benefits



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The important work of Security Planning and Compliance will meet the commitments made to the customers and staff by developing and maintaining security architecture definition, structure information framework (schema) for event recording, and security policy to ensure compliance from USPTO user community as well as the external users. In addition the commitments, benefits will also be realized, such as:

- Alignment of AISs with enterprise architecture and lower cost of ownership accreditation at a superior security posture;
- Efficient identification and development of security solution by subject matter experts;
- Reliable log files since the corrupted servers do not maintain them;
- Compliance with Federal requirements and basis for enforcing business priorities;
- Reflection and authorization of business priorities and security; and
- Integration of policy into daily activities for enhanced compliance.

1.3.8.8 Security Training

a. Description

The Federal Information System Management Act (FISMA) requires that the CIO of federal agencies to train all personnel with access to information systems and individuals that have significant responsibilities for information security. General training must occur annually at minimum for all users and role-specific training has been assigned a three-year completion cycle by USPTO's IT Security Office. All USPTO personnel will be required to be knowledgeable of their security responsibilities and principles of effective risk management. Personnel in jobs administering and maintaining operational systems are required to be knowledgeable of IT security vulnerabilities, how to correct these vulnerabilities, and what technical procedures should be implemented for maintaining secure operational systems and their infrastructures. The OMB Circular A-130 Appendix III requires that all government employees and contractors take user awareness training once a year. The USPTO met this requirement most recently on July 30, 2004 and will continue to administer security training on an annual basis.

b. Commitments and Benefits

The training will improve the operation of the IT security program – meeting the commitments to the staff and customers. In addition, the overall benefit is that the confidentiality and integrity of USPTO systems will be maintained based on individual



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ability to prevent system exposure to threats. USPTO management and staff will be better equipped to resolve incidents of security violations.

1.4 OCIO Program Support Services

This service supports the implementation of the OCIO program as part of the roles and responsibilities of the CIO at USPTO. The support ranges from assistance with IT acquisition to Section 508 compliance. Project management services are also included such as analysis of baselines, project scheduling, performance goals, and all the other elements of project management. Training, Lifecycle Management, and SEPG support are also important parts of the OCIO support services.

1.4.1 Acquisition Support Services

The USPTO IT acquisition strategy is aligned with the overall strategy to manage the IT infrastructure separate from the applications and data that use that infrastructure. This strategy also integrates acquisition management into the planning process. Key elements of the USPTO IT acquisition strategy include:

- **Continue to consolidate sources of supply**: Continue to consolidate similar requirements into one statement of work, as practical and reasonable; make the consolidated contracts the preferred sources of all IT products and services; require that acquisitions from other than these preferred sources be justified; and lengthen contract duration when justified by incumbents' performance;
- **Maintain reliable and flexible sources of supply**: Continue to build in flexibility by using technology infusion clauses to prevent obsolescence; include options for future generations that cannot be fully specified at the time of contract award; increase the use of COTS hardware and software; establish USPTO-wide contracts based on technical standards, when appropriate and cost-effective;
- **Continue to enforce technical and contractual standards**: Continue to centralize technical duties of acquisition management and contract administration into one office; ensure that all IT contracts have consistent and enforceable provisions requiring compliance with the USPTO's Lifecycle Management Manual and associated Technical Standards and Guidelines, Technical Reference Model, project management tools, cost/schedule controls, and other standards; and provide incentives for compliance and penalties for non-compliance to standards;
- **Further streamline acquisitions**: Adapt USPTO policies and procedures to take full advantage of streamlining allowed by laws and regulations for acquiring and administering federal contracts, notably the: Federal Acquisition Streamlining Act



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(FASA), the IT Management Reforms provided through the Clinger-Cohen Act and the resulting revisions to the Federal Acquisition Regulation (FAR), and OMB guidance promoting consideration of past performance in contract acquisition and administration;

- **Encourage more small business participation:** Require that contracts continue to provide ample and appropriate opportunities for small businesses including increasing the minimum from 20 to 25 percent participation on the System Engineering and Technical Assistance (SETA); enforce requirements that the System Development and Maintenance contractors meet goal of 10 percent and the ITPA small business participation; continue to set-aside the Facilities Management and End User Support (FM/EUS) contract; and continue to use small business contracts for specialized services and limited scope applications; and
- **Improve management of contract acquisition and administration materials:** Establish Contracting Officer's Technical Representative libraries that contain acquisition documents, orders, deliverables, and invoices for all IT contracts; provide authorized USPTO and contractor staff with on-line access to, and text search of, these documents and materials; and expand the use of electronic interchange of these documents between the USPTO and contractors.

The Acquisition Support projects supply the USPTO with best-value IT products and services to satisfy business requirements for maintaining existing AISs and for developing new AISs identified through business process reengineering efforts. The customers of the IT acquisitions are the USPTO business areas and the Office of the CIO. These customers seek IT contractor services, hardware, and/or software for new or existing AISs. The work to be performed on the acquisition projects falls into two categories: administration of existing contracts, and acquisition of contracts to replace or supplement existing contracts.



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<i>Type of Work Performed on Acquisition Support/Management Projects</i>	
Contract/Order Administration	Acquisitions
<ul style="list-style-type: none"> - Serve as Contracting Officer's Technical Representative on all IT contracts - Help USPTO system development managers prepare AIS project plans - Prepare statements of work, plans, and independent estimates of cost to complete work - Obtain detailed plans with resource estimates from contractors - Evaluate available contractors to determine which should perform the work - Assist in start-up of work and transition from incumbents - Monitor work progress and resolve concerns about delays, overruns, or poor quality - Receive, distribute, and archive contract deliverables - Contract financial management, including monitoring funding status, controlling award fee pool, and processing invoices - Close out contract once work is completed - Assess contractor performance and recommend award fees 	<ul style="list-style-type: none"> - Serve as acquisition managers, including chair of the IT source evaluation board - Conduct market surveys, including interacting with vendors to assess their products and services - Determine acquisition scope, methods, resource requirements, and schedules - Implement new acquisition regulations, guidelines, and practices - Prepare pre-solicitation documents - Obtain approvals to proceed with acquisitions - Prepare solicitation documents - Manage source evaluations, including evaluations of proposals - Conduct benchmarks, operational capabilities demonstrations, and live test demonstrations - Establish contracts as USPTO-wide preferred sources when appropriate - Review requisitions for IT products and services to ensure compliance with USPTO standards and preferred sources

The following efforts are underway to reuse what has already been done by other projects. Implementation of the IT acquisition strategy will include building on the following models and procedures that have proven successful in previous years:

- **Technical Standard and Guideline for Contract Management:** The USPTO's Project Management Manual documents procedures for managing IT service contracts, focusing on task order planning and control. It is now being used as the model for a new TSG that is under review. This TSG will provide improved guidance for the management and acquisition of new IT products and service contracts;
- **Ordering Guide:** The OCIO prepared this handbook in 1997 to provide a "customer-friendly" document describing ordering procedures and products available from the consolidated Desktop Workstation contract. It is now being used as a model for additional paper and electronic brochures that provide summary-level guidance about acquiring IT products and services;



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- **IT Source Evaluation Boards**: The USPTO established a new Source Evaluation Board in 1995 to manage major IT acquisitions. This board provides the model organizational structure needed to conduct future major acquisitions, now performed by empowered multi-disciplinary teams using streamlined acquisition techniques. Models from SDM, SETA, Desktop Computers, ITPA, and other successful previous acquisitions will be used for future acquisitions;
- **Acquisition of IT Products and Services Policy**: The OCIO reviews all requisitions for IT products and services. The purpose of the review is to ensure that the items or services being acquired comply with technical standards and methodologies; and that when possible they are being acquired from preferred sources. The OCIO works with the Office of Finance and Office of Procurement to screen all requisitions to determine which require IT approval, reviews and either rejects or approves each requisition, and works with customers to find better solutions for those requisitions that are rejected. The procedures include the flexibility to obtain waivers from standards and preferred sources when appropriate, and the delegation of authority for review of certain purchases to the requestor's approving official. Policies and procedures for OCIO review of IT requisitions are documented in a memorandum of agreement among involved USPTO offices, and were announced in the CIO Newsletter volume 5 issue 3 dated Fall 1998;
- **IT Acquisition Management Libraries**: The USPTO has been improving its collections of documents and other materials by centralizing and standardizing collection and indexing procedures, and compiling paper copies of all materials and electronic copies of some of the documents in the collections. The USPTO is now scanning the back file and plans to eliminate paper libraries in order to lower storage costs, reduce problems with lost and archived documents, and improve library customer service;
- **IT Acquisitions Home Page**: The USPTO developed materials about IT acquisitions that were added in 1995 to the USPTO's website home page under "IT acquisitions." This page included copies of the IT plans and requests for proposals for upcoming acquisitions, and was the primary source of materials needed by offerors. This page will be further expanded in the future to include more materials, a user-friendlier interface, and better integration with USPTO and other federal electronic commerce systems;
- **Software Enterprise Licenses**: The USPTO has been establishing enterprise licenses since 1995 with major software suppliers such as Microsoft, Oracle, and OpenText (formerly Dataware); and
- **Asset Inventories**: The USPTO first took and certified detailed inventories of fixed assets in 1997- 1998. Certified inventories of hardware and software are



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now being used in statements of work for support contracts. For example, the inventory of HP UNIX servers is the basis for the contract for hardware maintenance. The inventories previously used were typically prepared ad hoc by the COTR or operations managers, and were not reconciled or certified, so were prone to errors and omissions.

1.4.1.1 Acquisition Activities

a. Description

The Office of Acquisition Management (OAM) manages the acquisitions and administers nearly all USPTO IT contracts. The OAM uses these "Acquisition Support" funds to obtain contractors who perform the following contract acquisition and administrative activities: (1) conducting market surveys and obtaining price quotes for commercial items; (2) receiving and distributing contract deliverables; (3) managing libraries containing acquisition and contract documents; (4) performing data entry for OAM and USPTO procurement systems; and (5) providing highly-specialized consulting support services when an independent source is required. This contract is the preferred and primary source for these services, and indirectly supports all OCIO offices. The Office of Acquisition Management also has contractor support requirements to assist in re-competing major OCIO IT contracts. The OAM uses these "Re-competition of Major IT Contracts" funds to obtain expert consultants and support contractors to supplement USPTO. The goal of these activities is to ensure that the USPTO identifies and selects the best value from among the proposals by performing the following contract acquisition activities: (1) provide training and advice on how to address new requirements for major federal acquisitions; (2) provide samples or models of acquisition documents from other federal agencies; (3) assist in the preparation of statements of work, evaluation procedures, requests for proposals, and other acquisition documents; (4) manage libraries of proposals and evaluation materials; (5) analyze and report on proposed cost components and anomalies; (6) provide clerical support for checking offerors' references; (7) prepare executive summaries of proposals; (8) provide legal support during protests by losing offerors.

b. Commitments and Benefits

Acquisition Support Services is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. Acquisition Support enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure, migrate AISs to operate on an evolving infrastructure, and enhance and improve the tailored lifecycle management process. The benefits to be realized by Acquisition Support/Management projects and services are described below:

- **Faster response in providing IT products and services**: Consolidated contracts provide larger and better-qualified pools of labor and supply channels for IT



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products. The larger the pool, the higher the likelihood of responding to increasing demands for keeping AISs and the IT infrastructure operational. Enterprise licenses for software, and consolidated contracts for hardware and maintenance, allow more flexibility to quickly infuse new technology;

- **Fewer disruptions in AIS operations caused by gaps in IT supplies:** Poor management of IT contracts can result in disruptions due to a gap in services or supplies. Consolidation and centralized management of acquisitions and contracts reduces the risk of these gaps by: simplifying planning for replacement contracts, creating larger and more diverse pools of contract labor and supplies, allowing for broader and more flexible statements of work that can better meet unexpected requirements, and providing a cadre of acquisition expertise to expedite sources to fill emergency needs;
- **Fewer disruptions in AIS operations caused by poor quality IT services or supplies:** Poor management of IT contracts can result in disruptions due to poor quality supplies. Standardization through consolidation and centralized management of IT acquisitions and contracts increases contractor compliance to technical standards. This reduces the risk that AISs developed by the USPTO will be unreliable or difficult to repair when they fail, thereby reducing the potential for major disruptions in AIS support to all business areas;
- **Lower costs for hardware and software:** The standards defined in the USPTO Technical Reference Model, when properly implemented in IT contracts, offer numerous benefits. These standards result in reduction in costs of training internal staff to deal with non-standard products, and increase the likelihood that AISs are open and easily inter-operable. Proper implementation in IT contracts provides economies of scale through acquisition of larger volume and more flexible site licenses, more opportunities for lower cost third-party maintenance, and provides suppliers with better incentives to provide the best hardware and software at the best price; and
- **Lower costs for IT contract acquisition and administration:** Consolidation of requirements has, and will continue to reduce the number of contracts. The associated reduction in the number of acquisition managers and Contracting Officer's Technical Representatives produced FTE savings every year since 1996 by allowing the USPTO to take on the significant workload of acquiring the new contracts and transition from incumbent contract while reducing management and staff time previously devoted to contract administration.

1.4.1.2 Acquisition Management Library System (AMLS)

a. Description



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The CIO is responsible for acquiring and managing IT contracts. This requires the management of libraries of acquisitions, contracts, task orders, contract deliverables, contract modifications, and support materials related to the contract. All of these materials are currently managed on paper even though most are available in electronic form. The CIO needs an integrated library automation and information retrieval tool that can improve the search and retrieval process for USPTO staff and contractors by facilitating on site and remote access to various acquisition library collections.

Specifically, the CIO needs software tools that can provide employees and contractors with improved quality of, and enhanced efficiency in, capturing, storing, and retrieving acquisition and contract information. The capability to search stored documents (either word-processed or image files) is especially critical. Potentially useful fields include task order number, document control number, document title, document type, and date. The library user must also be able to circulate and track physical documents. In addition, the need exists to link search request output directly to the full-text of an on-line document and to display the results in their "native" form. The Acquisition Management Library System (AMLS) provides the capabilities that are necessary for electronically managing IT contracts.

b. Commitments and Benefits

OCIO Acquisition Libraries enables the USPTO to carry out its mission by providing more effective resource management. Automation of the acquisition libraries will provide the following benefits: Automation of the libraries will reduce the time, money and space currently expended filing and managing the retention of paper records. The system will provide the ability for the USPTO to more quickly and effortlessly respond to oversight agency's queries regarding acquisitions, contract management, and contract deliverables. All pertinent records will be available for auditing or research in the preparation of similar acquisitions or extension of existing acquisitions.

1.4.1.3 Contract Management Activities

a. Description

The Program Management task order pays the costs for the following contract management activities: (1) recruit, train, and supervise all contractor staff and subcontractors; (2) plan, prepare, submit, and negotiate proposals for all work to be performed; (3) control all work performed, including final quality control and deliverables; (4) manage financial operations including regular and extensive reporting of planned and actual costs; and (5) resolve concerns about contract performance. The USPTO centrally funds and manages these duties to improve controls over the alternative approach of indirect allocation of these costs to the contract's task orders.

b. Commitments, Benefits, and Performance Measures



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The Contact Management Activities provides the formal structure required to control, manage, and report contract administration as required by the Federal Acquisition Regulations (FAR) and Cost Accounting Standards (CAS). Contract management activities also provide central point of control for program management consistency. This project ensures that USPTO is managing contracts in accordance with FAR and CAS regulations, and provides significant management visibility and cost savings through accepted and approved program management practices used uniformly on all government contracts.

1.4.1.4 Section 508 Support

a. Description

New legislation mandates that the Federal Government provide the same level of IT access to everyone, including employees and members of the public with disabilities. Revised Section 508 under the Rehabilitation Act requires that all new IT procurements meet strict standards in order to provide the infrastructure for accommodations. Sections 501/504 provide accessibility accommodations for individuals through the infrastructure. The revised sections specifically provide:

- **IT Planning and Budgeting**: IT plans and budgets must include resources to acquire compliant hardware and software, assistive technology, and support services to ensure that software system development is compliant, and there is staffing to oversee new product compliance and provide Section 501/504 accessibility throughout the USPTO;
- **Acquisition**: When procuring and developing IT products, OCIO must ensure that they comply with the Access Board EIT standards. The government is subject to litigation for violating Section 508 requirements;
- **Section 508 Monitoring**: To ensure that systems are being developed with Section 508 compliance, tracking activities include assessing, obtaining, testing, training, and maintaining accessibility tools. Evaluating web pages and software systems are also essential. Providing feedback on correcting non-compliant issues and evaluating new accessibility products for the baseline are part of the Section 508 support; and
- **Workforce Issues**: The OCIO is responsible for Section 508 oversight and for providing Section 501/504 EIT accommodation support to the USPTO. The USPTO EIT Accessibility Coordinator reports to the CIO. Section 508 Training is also an important aspect of ensuring system compliance that falls under the OCIO.



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b. Commitments, Benefits, and Performance Measures

The Access Board is preparing documentation this fiscal year to determine performance measurements by establishing a baseline, as well as monitoring, and reporting requirements.

Through a joint USPTO effort, a Section 508 procurement process was developed that enables employees to expeditiously procure items within the framework of the law. Current efforts include: (1) providing assistance to software development efforts to ensure Section 508 compliance; and (2) creating a permanent, centralized structure for accommodating employees with disabilities under Section 501/504.

1.4.2 OCIO Project Management Support Services

This project enables the OCIO to receive assistance in project management, including baselines, project scheduling, and other facets of project management. Also included is penetration testing to ensure adequate security processes are in place. Training, Lifecycle Management, and SEPG support are also important parts of the OCIO support services.

1.4.2.1 Automated Project Management System

a. Description

To help monitor and provide visibility into actual progress of each IT project, the USPTO has implemented the Automated Project Management tool (APMS). The APMS provides for tracking actual cost and schedule performance against project plans. It also provides visibility to help both business and technical managers identify problem areas and take corrective actions when actual results deviate significantly from plans.

Key areas of support include (1) executive dashboard, schedule, budget, and portfolio management development, maintenance, and enhancement activities, and (2) general day-to-day APMS operations and maintenance support management capabilities.

b. Commitments and Benefits

Key benefits to be realized include (1) improved strategic planning, budget formulation, and investment capital planning and (2) improved life cycle management and access controls to insure the timely delivery of quality IT products and services to the business areas and adequate security.

1.4.2.2 Lifecycle Management and Software Process Improvement

a. Description



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This project provides LCM methodology, process, and technology training. As methodologies, processes, and technologies change, organizations need to adapt their lifecycle to new approach of conducting IT business and educate the lifecycle stakeholders in the new methodology or process. The approach for improving the LCM practices is two-fold: (1) to streamline and improve the current LCM for immediate results and (2) to transition the USPTO to advanced practices. The OCIO will work to streamline the LCM policies, procedures, roles, and responsibilities governing the initiation, definition, design, development, deployment, operation, maintenance, management, and retirement of AIS. The LCM objectives are as follows:

- Reduce the amount of documentation;
- Increase the value of artifacts;
- Increase the quality of artifacts;
- Ensure artifact development as an inherent part of the development, not an after-the-fact recording activity;
- Increase the ease of maintenance of artifacts;
- Shorten the development lifecycle;
- Increase the level of tool support for the development process;
- Decrease the burden of the formal review and approval processes on the project;
- Increase the value of the reviews and approvals;
- Provide greater flexibility in methods to accommodate different project types; and
- Migrate from paper based system documents to electronic models.

The strategic direction that will allow the USPTO to implement advanced LCM processes are based on adoption of proven development methods and toolsets, including object-oriented design, Rational Unified Process (RUP), Unified Modeling Language (UML) notation, XML, and iterative development and model-drive architecture methods. This strategic direction and engineering practices are founded on strategic enterprise architectures, service oriented architectures, component-based development, asset-based development, iterative development within release management, portfolio and operations insight, model-driven development, and integrated toolsets.

Where the need arises for specific training in an LCM methodology, process, or technology, that training is provided through this project. The LCM will be streamlined for simplicity, reduce the workload by developing highly effective documentation, and support and adhere to a flexible process. This effort will consolidate reviews and work products, thereby, improving the quality of work products, leveraging training, and identifying lifecycle process metrics to help guide AISs as they move through the lifecycle.

b. Commitments and Benefits

The commitments to the customer and staff are being met by streamlining work products to capture information once for multiple usages. Process flexibility is improved, and



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Requirements engineering has been expanded to improve definition of requirements in the elicitation process. The Lifecycle process metrics are identified and implemented to guide AISs as they move through the lifecycle. Education and training are provided for new methodologies and processes. In addition, the benefits of this activity include:

- A mechanism for educating best practices in technologies and methodologies that have a direct impact on software development, and therefore, delivery of business value through quality AISs. This supports the two OCIO values: Valuing employees and Quality;
- Product that can be delivered sooner to customers;
- Products that are higher quality at reduced costs;
- Lifecycle reviews and work products that appropriately align with the scope and complexity of the project;
- Product stability and Customer satisfaction. A robust Requirements Engineering process helps to build the right product; and
- Increase in project success rate by providing indicators that may be used for redirection of lifecycle activities, as needed.

An improved LCM that will accommodate development of systems with new technologies that provides higher quality of service and products. The updated LCM methodology is expected to provide the basis for cost savings, increase in AIS quality, and quicker rollout of new business process improvements through shorter AIS development cycles. The new business improvement opportunities that the new LCM would provide will position USPTO as the global IP leader.

1.4.2.3 OCIO Training

a. Description

The Clinger-Cohen Act of 1996 requires that the OCIO develop strategies for training and professional development of its staff. The PMA requires the strategic management of human capital. This strategy will allow critical technical training, management training, and project management training to be accomplished. OCIO training will be focused in the following areas:

- **Critical technical training** will be planned in alignment with the OCIO Road Map of major operational events. This will include training in technical areas such as: .Net Architecture, AIX, Disaster Recovery, E-Business Patterns, Enterprise



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Directory Services, Enterprise Portal Development, Websphere, Java, J2EE, OOA&D, UML, Oracle, Rational Unified Framework, Red Hat/Linux, XML, Windows XP.

- **Management training** is planned in the following areas: (1) Organization/Administration - Leadership, HR Management, Strategic Planning, Government Laws/Regulations, Organizational Plans, Policies, & Guidelines; (2) Behavioral skills - Coaching/Motivation, Team Building, Communications, interpersonal skills, Decision-making, Influencing, Negotiating, Problem Solving, Strategic Thinking, and Quality Management/Continuous Improvement; and (3) Technical leadership - Business Knowledge, Acquisitions/Contract Management, Enterprise Architecture, Budget/Finance, e-Government, Knowledge Management, Performance Assessment, Capital Planning and Investment, IT Security Information Assurance.
- **Project Management training** is planned to provide training to approximately 30 students. Project Management Training assists in satisfying the OMB requirement for Project Manager Certification, and allows OCIO to strategically manage its workforce to meet current and future requirements in all phases of systems development. OMB guidelines outline the following criteria: a qualified project manager is someone who is (1) has managed projects that are within 10% of baseline cost, schedule, and performance criteria, or (2) PMP certified; and (3) is full-time employee.

b. Commitments and Benefits

Training in technical, management, and project management of IT assets will lead to effective leadership to manage the organization, identify successful systems/applications to address current and future business requirements, and enable project leaders to manage their activities within budget, schedule, and performance goals.

1.4.2.4 Project Management Support

a. Description

Project Management Support is an IT infrastructure function that supports all business areas as well as IT infrastructure projects. This support enables the USPTO to maintain current business production, improve and enhance current business and IT infrastructure, migrate AISs to operate on an evolving infrastructure, and enhance and improve the tailored lifecycle management process.

Key areas of support include business area-wide IT project management advisory and assistance support services with regard to (1) project plan preparation, baselining, and maintenance, and (2) recurring customized APMS reporting requirements. This activity



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also includes support for program management communications, Capital Planning and Investment Control (CPIC) related strategic planning; budget formulation and execution, and AETS IT infrastructure planning.

b. Commitments and Benefits

Key benefits to be realized include:

- Improved project decision making, cost control, and productivity; and
- Expedited and improved problem/issue/risk detection, management, and mitigation.

1.4.3 Product Assurance Services

Product Assurance Services include enterprise services and tools to perform and manage quality assurance, quality control, requirements management, and configuration management activities in accordance to USPTO's LCM process. In addition, enterprise support for configuration management, testing, quality assurance, and requirements management tools are key elements of this service throughout the system life cycle. Investment in an automated CM function yields the following business value: reduces development costs by providing facility for systematic storage and retrieval of project components; reduces development time by keeping development components easily accessible; and reduces risk to the business area by ensuring correct assembly of project components.

Specifically, Product Assurance Services include the following activities in Configuration Management (CM), Requirements Management (RM), and Quality Assurance (QA):

- Configuration management activities to maintain existing AIS baseline, functionalities, performance, and operational capabilities;
- Configuration management activities to support strategic plan initiatives; and
- Quality Assurance that is built into the system, including enterprise quality planning, IV&V product and deliverable reviews, Peer reviews (in balanced scorecard), audits, surveys, root cause analysis, QA process management, and QA analysis and trends.

Requirements Management support for AISs. Independent Requirements Management functions are an integral part of the industry standard Independent Verification and Validation (IV&V) practices. Independent Requirements Management ensures that customer needs are clearly, concisely, consistently, and unambiguously communicated. This item covers the independent assessment, to include informal and formal Peer Reviews, of project requirements documents/artifacts. These activities are recognized as



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industry best practices and have been proven to reduce development and maintenance costs.

The CM, RM, and QA activities will streamline development process through consistency and reduction of rework, supports central information/data capture and ease of retrieval, ensures configuration baselines are maintained as changes made, ensures project artifacts match documented/identified baselines (physical descriptions), and production baseline is captured and deployed in controlled CM environment. This investment is conducive to a reliable and secured software build environment to reduce the error in testing and deployment. In return, customers and staff will have AISs based on improved quality and reliability, which assures that the delivered product, satisfies the user's business and operational needs.

1.4.3.1 Configuration Management – Enterprise Activities/Database

a. Description

This activity supports the development and revision of CM Technical Standards and Guidelines (TSG), pocket guides, and related instructional materials. Analysis of the metrics, trends, and white papers related to Configuration Management processes are also included in this activity. The Configuration Management library and COTS software repository, including producing file copies of COTS packages, are also maintained through this project. Configuration Management process areas are analyzed and white papers generated based on the analysis. Specific users are given support, such as assisting Help Desk in resolving a specific problem.

b. Commitments and Benefits

The commitment to the customer and the staff are being met by the development of CM TSG/reference guide, metrics related to CM, and databases that maintain CM processes and results, allowing for continued enhanced to the CM process. Also, the benefits from this activity include the reduction of development costs by providing a facility for systematic storage and retrieval of project components, decrease in development time by keeping development components easily accessible, and risk reduction the business area by ensuring correct assembly of project components.

1.4.3.2 Configuration Management

a. Description

This activity ensures that AIS technical documentation for USPTO business software is complete, current, and accurate. All technical documentation for software becomes outdated, if not maintained on a regular basis, will no longer be of use in developing, enhancing, or maintaining the software used to support our business processes. The



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physical configuration audits (PCA) are intended to periodically identify weaknesses and defects in all AIS technical documents that have occurred over time as a consequence of maintenance or enhancement activities, where due to limited resources or other factors, the corresponding technical documentation for these systems could not be appropriately revised. The PCA process helps ensure that all AIS source code, environmental components and documentation, and all other AIS work products filed in the Enterprise Configuration Management repository are accurate and relevant.

The IDE must also be specified, designed, developed, and tested in a controlled environment in order to be an effective tool in the development of AIS software. For this reason, Enterprise CM must play a key role in the deployment of the IDE. Moreover, Enterprise CM will also play a critical role within the IDE by managing the deployment of new AIS software, new enhancements to AIS software, and maintenance releases of AIS software to the test and production environments.

b. Commitments and Benefits

The commitments to the staff and customers are being met by ensuring that the technical information needed to support AIS development, enhancement, maintenance, relocation, and disaster recovery is effective and available at all times. All AIS source code is stored in the CM repository and all components of the AIS operating environment are stored in the Configuration Management Repository with accurate documentation. The hardware, software, and documentation of IDE are also maintained. There is effective management of new AIS development, enhancements, and maintenance from the IDE to the test and production environments.

1.4.3.3 Enterprise Process Configuration Management Tool Dimensions

a. Description

New services, such as release of all production software to the production environment, are being requested of the CM infrastructure that will necessitate that the CM infrastructure be continuously available for use 24 hours/day, 7 days/week. The Enterprise Process CM Tool (PVCS) Dimensions supports the acquisition of hardware maintenance and additional hardware needed to provide this level of service without affecting critical and on-going data back-up processes, and to replace aging Configuration Management infrastructure components currently in service. This tool is also used to create, brows, copy, extract, and return configurations items throughout project's live cycle. These configuration items including USPTO Life Cycle Management Standards and Guidelines, Technical Notes, all technical documentation for AIS, baseline images, source code, and executable code. This tool is used to assist the Office of System Product Assurance in ensuring that all aspects of the USPTO Information Technology and the USPTO Technical infrastructure are well defined, and



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completely and correctly controlled and maintained. This effort includes CM tool maintenance renewal, vendor consultant service and tool administration for developers and project managers.

Key activities consist of Configuration Management System (CMS) release during FY 2005, and subsequently CMS SW releases in FY 2006 to FY 2010. The CMS release includes releases of COTS Product, PVCS Dimensions 8.0. In FY 2005, one major upgrade and some minor maintenance releases are planned to apply SW patches as well as fixes for C&A findings and XP related fixes. CMS SW release will be done in house with contractor support.

In addition, additional license, maintenance, professional consultant support and tool administration functions for IBM Rational ClearCase/ClearQuest are included in this project to support the development of Solution Unified Process Configuration Management Tool (SUPM). The configuration and change management of the Rational Unified Process are acquired commercially in support of component-based development of software applications that are delivered to meet USPTO business needs. Together, these products afford deep integration of the configuration management and change management processes with the Rational Unified Process. This effort is initiated in FY 2004 and will be implemented using iterative development approach and completed by middle of FY 2005. This system will provide the real-time CM in the development environment and provide single repository for the reusable asset components at USPTO site.

b. Commitments and Benefits

This activity ensures that the CM infrastructure is reliable and technologically current, with the availability of CM infrastructure 24 hours/day, 7 days/week. The CM hardware infrastructure will support future releases of the CM software tool, applicable database tool, operating system, and related system utilities. The CM infrastructure supports AIS, change management, and configuration control. In addition to meeting the commitments to the customer and staff, development costs are lower by providing facility for systematic storage and retrieval of project components, correct assembly of project components reduces risk to the business areas, development costs are reduced, reliability of AIS software increases, and timely access to AIS' data is ensured by reducing the downtime caused by unexpected failures.

1.4.3.4 Enterprise Quality Assurance Management Tool

a. Description

The Enterprise Software Engineering Quality Assurance (QA) Tool will assist OCIO QA staff in collecting current Software Engineering QA data, analyzing trends, performing



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measures, and data mining eight years of historical data. Software development, tool purchase, vendor training, and contractor support are included in the management tool.

b. Commitments and Benefits

Using the Enterprise QA management tool will enable market surveys, trend analysis, risk analysis, workflow and process planning, and defect Root Cause analysis to be conducted. These activities meet the commitment to the customer and the staff because the OCIO can quantify the impact of technical policy, procedures, and standards. Also, software engineering QA data collection and data management can be formalized and the QA measuring processes can be improved. The benefit of the QA management tool is that the OCIO process engineers will have the information they need to ensure that quality OCIO products and services are delivered to the USPTO in a manner that is timely and cost effective.

1.4.3.5 Enterprise Requirements Tool

a. Description

The Enterprise Requirements Tool enables a close collaboration between engineering and project teams in performing analysis and planning of software and hardware requirements. The funding for this activity is allocated for license renewal, contractor support, and Hardware (HW)/SW upgrades and replacements.

b. Commitments and Benefits

The commitment to the customer and staff are met by ensuring that requirements specifications are accurate and complete through close collaboration between engineering and project teams, thereby, having SW/HW customizations that satisfy the end-user computing needs. The benefit of the tool is that savings are realized in terms of development time and costs associated with retrieval of project requirements.

1.4.3.6 Quality Assurance – Enterprise Activities/Database

a. Description

This activity supports the development of the Quality Assurance Technical Standards and Guideline, QA Reference Guides, technical notes, metrics, and related instructional materials. The QA in process reviews, operation of QA Library, the "lessons learned" repository, and the TRB "action items" repository are also managed through this project.

b. Commitments and Benefits



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The commitments to the customer and the staff are the special analysis that can be performed by applying the stored QA information to resolve unique problems or to develop concepts through white papers. The analysis that can be developed will improve the IT decision-making process, identify trends in AIS development, avoid costs through early detection of defects, and prevent same mistakes from occurring.

1.4.3.7 Requirements Management – Enterprise Activities/Database

a. Description

Requirements Management TSG, pocket guides, and related instructional materials (e.g. training support to Software Development Managers in developing software requirements documentation) are developed and updated. The requirements repository and requirements traceability reports are also maintained to allow for pilot tests of Requirements Engineering and Knowledge Management processes.

b. Commitments and Benefits

The ability to conduct analysis and develop concept papers regarding Requirements Management will help to reduce the business cost by early detection of deficiencies during the requirements gathering process. Revisions can also be limited by identifying misunderstood requirements early in the process.

1.4.3.8 System Acceptance Testing – Enterprise Testing Activities

a. Description

The enterprise testing activities consist of different components. First, additional effort is required to support relocation to Alexandria Headquarters, Virginia. Test scripts will be automated and maintained in preparation for testing baselines. Regression Testing will be performed as warranted by the scheduled moves to Alexandria Headquarters of employees and servers, to ensure that functionality is maintained between Alexandria Headquarters and Crystal City. Second, performance and stress testing will enhance system quality by ensuring that bottlenecks that impairs system response times or other performance measures are detected as early as possible in the system development lifecycle. Third, compatibility will be ensured between development AIS and existing desktop baseline(s) prior to deployment. Fourth, the Test Facility and minor computer replacement parts are maintained. Fifth, proficiency of staff will be enhanced for operating automated test tools through training and licensing. Lastly, support is required for maintaining the Test Facility. The Test Facility consists of workstations, servers, network components and other hardware/software necessary to build the testing configuration to conduct formal qualification testing on all AIS for acceptance and deployment.



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b. Commitments and Benefits

The commitments to the customer and staff are being realized because systems testing will ensure that the AIS functionality does not degrade after deployment. Systems testing enterprise-wide maximize AIS uptime, provide advance notice of system limitations, and minimize the probability of system downtime due to response time problems, concurrent user logins, or other bottlenecks in the system architecture. Automated test scripts and thorough testing procedures will improve testing effectiveness and efficiency, elevate the quality of operational systems, and ultimately, provide a more efficient USPTO operation.

1.4.3.9 Independent Acceptance Testing

a. Description

This activity provides for Independent Acceptance Testing of Strategic Plan Initiatives. Testing types include Formal Qualification Testing (FQT), Maintenance Release Testing (MRT), Software Compatibility Testing (SCT), Performance Testing (PT), and Non-Functional Testing. The purpose is to verify independently of the developers that users' requirements have been implemented correctly and completely and includes infrastructure testing where appropriate, which verifies that proposed new applications and changes to the infrastructure will not break or unacceptably degrade any existing information technology. Activities include test planning, test plan development, test procedure development, test execution, and test reporting.

b. Commitments and Benefits

The purpose of the project is to ensure that the system requirements are implemented correctly and completely. The customers are delivered the AISs they need to perform their daily business functions. The OSPA testing process will ensure that the testing being planned meets with the approval and that it satisfies the testing needs in each particular development effort. System testing will permit capability to report testing results at PRR as part of the development life cycle to ensure that the TRB is aware of any existing problems so that deficiencies in production are minimized.